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DECEMBER 2002

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VOLUME 17
NUMBER 12
DECEMBER 2002

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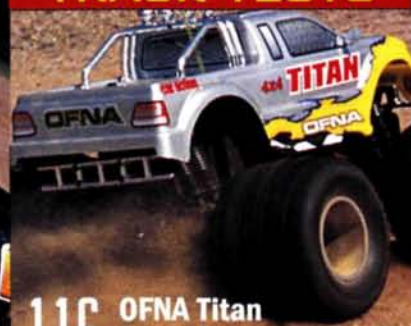
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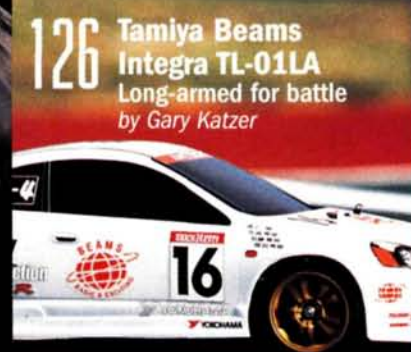
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ON THE COVER: HPI Savage 21; photo by Walter Sidas.



Happy New Gear!

There's still a ways to go before we ring in 2003 while making fun of Dick Clark's New Year's Rockin' Eve at the local house party, but when it comes to RC stuff, the new year is here! You may have to wait a while before the new gear lands in your local shop, but the latest products are indeed ready to roll off the assembly line and into your hot little hands. We have the inside line on all the new cars, trucks, engines, batteries, motors and more, and you can see it all in the 14-page super feature, "Hot, New, Now!" starting on page 70!

Also in this issue, you'll enjoy gaining more insight into some of the hottest new releases—especially if you're a truck guy (and who isn't?). We have exclusive back-to-back "First Looks" at the Associated Monster GT (shown here) and HPI Savage 21—the latest big-block machines to challenge the domination of the Traxxas T-Maxx (which has a few new tricks of its own, thanks to the innovative new TRX 2.5 engine and a new "SportMaxx" variation. See last month's issue for the story on the new Maxx, and check out "Hot, New, Now!" for the SportMaxx). OFNA is in the mix, too; you'll find a complete test of the Titan—OFNA's radical lifted-chassis monster—on page 116. And race fans, we've got you covered; Mugen's first ever nitro stadium truck, the MST-1, gets the "Track Test" treatment as well.

Forget what the calendar says; 2003 is here!

Peter Vieira
Executive Editor



Minis & Micros is coming!

As small RC continues to get big, we figured it was time to give the mini and micro machines their own special issue! *Radio Control Minis & Micros* is full of the latest cars, boats and planes, with plenty of getting-started info to help first-time drivers and pilots have the best RC experience. But there's still plenty of excitement for us in-the-know types, with exotic project cars, an "insane speed" HPI Micro RS4 and a complete guide to all the cars in the micro universe. Look for *Radio Control Minis & Micros* on newsstands in November!

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D5 HOTSTUFF

Flatliner Arm VS Round Wire



Trinity presents the latest in R/C modified motors.....

"Flatliner FlatWire™" technology produces a low polar moment of inertia due to the shape of the wire and the fact it makes a neater compact pattern closer to the armatures core. This allows the armature to start and stop faster for more punch off the line and out of the corners. The increased surface area of FlatWire against the armature web saturates the armature laminations to a greater degree than possible with round wire. The result is a more powerful, more efficient armature for the same number of turns verses round wire.

The D5 Flatliner armatures come in doubles and singles and will fit P-94, D4, D3.5, Speedgems and most modified motors made by other manufacturers. The singles are quite awesome and are the ones Josh and I recommend.

Jim Dieter

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READERS WRITE

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RETRO ROCKET

I read about the Dynamite Rocket Racer in the July issue and was very impressed with it; I thought it would be a great thing for winter. The only drawback is that there aren't any hop-ups available for it. Is Dynamite (or any other company) going to offer hop-ups, and if so, when? Will Trinity offer a rechargeable battery pack for the Rocket Racer just as it did for the Micro RS4? [email]

Dylan Haley



Actually, Dynamite does have hop-up parts for the Rocket Racer, including aluminum wheels, a graphite chassis, hotter motors, foam tires and gearing options, as well as a bunch of new body styles. I don't know if Trinity has plans for Rocket Racer packs, but you should be able to retrofit Trinity's Micro RS4 packs (or those of any other battery maker) in the Rocket Racer, since it uses the same battery plug as the Micro RS4.

—Pete

TIP OF THE CAP

I picked up the September issue and read the article about the IFMAR Off-Road Worlds winners. I liked that they were all Team Losi machines. As I read about the buggies, I noticed that Jukka Steenari's Double-X4 has a capacitor that looks as if it was hooked up to the ESC. I recognized the capacitor from my high school electronics class, so I know how a capacitor works and that they are found in almost all electronics, but why does he have one in his car? None of the other Losi guys have them; in fact, I couldn't find another capacitor in the whole magazine. Does he have a prototype ESC that needs one to run, or does this give him longer run times? I want to know whether I should consider putting one in my car, and if I should, where do I hook it up and which size should I get? [email]

Ian Lindahl

Most high-frequency speed controls, Jukka's Novak Cyclone C2, for example, require the use of an external capacitor. LRP's Quantum does not, but many racers opt for LRP's "Worlds Upgrade kit," which includes two

capacitors that help tune the Quantum's power and efficiency. If your ESC doesn't call for a capacitor, you don't need to worry about it.

—Pete

THE ORIGINAL PROGRAMMABLE ESC

My dad's friend had some RC stuff that he wasn't using, so my dad persuaded him to let me have it. In the big box of assorted cars and parts, I found a tiny ESC made by DPI. A guy at my local hobby store said that it is a drag-racing ESC and can handle around 36 cells. The ESC is called a Zeta Pro, "Drag Micro" is printed on the case, and it also has a box for programming it. The box has seven or eight little switches and a button that says, "Send to ESC." I haven't a clue how to program it, and I have spent hours trying different combinations and have checked the Internet, with no luck; you are my last hope. Would you please help me by printing something in *RC Car Action*, or forward this letter to anyone who might have a clue? I don't know how old this is, but I'm sure

that in RC terms, it's prehistoric. [email]

Nick Sweo

tc3punk@directvinternet.com

Nick, I believe what you have is the very first programmable speed control; it predates Tekin's 410K (remember that one, with the built-in keypad?) and the Novak Cyclone series. I'd save your Micro Drag as a collectors' item, but if you've just gotta run it, I'm sure there's a reader out there who can help you out. If any of you grizzled veterans can help Nick, shoot him an email.

—Pete

HANDOUT HELPER

I have a question about Handout motors by Trinity. I bought two off a guy who is very honest and knows his stuff. He said they're good and are very fast. Are they better, as in faster, than the P2k Pro or P2k2 Pro? [email]

Chris Secor

I think it is interesting that you capitalized the "H" on handout. A "handout" motor isn't a brand name; it's a motor that is handed out to stock-class racers at a big event by the race officials as a means of guaranteeing that the racers have equal horsepower. Typically, each racer's stock-class entry fee includes one handout motor and the option to buy one additional motor. Hardcore racers always buy the extra motor, as it increases the chances of getting a "sweeter" motor.

I don't know which race your "guy" attended, but if the handout motors were from Trinity and the race wasn't a million years ago, then

[illegible]

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Matt Francis, Jim Dieter, Paul
Lemieux, Josh Cyrul, Adam Drake,
Chris Smith, Todd Hodge &
Joel Johnson**

they're probably either P2ks or P2k2s. And they're either well tuned and fast because your guy "is very honest and knows his stuff," or they're thrashed-out lumps that he pawned off on you under the auspices of being honest and knowing his stuff.

—Pete

WACKY OR TACKY?

I was reading "Readers Write" in the October 2002 issue, and I think that more wacky projects would be great! What about a "Project Mobile Snack Getter" (ha, ha) or "Project Monster Surveillance" or "Project Sister Soaker" (ha, ha). I could think of more, but it's early; I hope more people send in other ideas so that you guys will make more wacky projects. [email]
Austin Clary

Is your sister hot? Or are you talking about
soaking a nun?
—Pete

MISSION ACCOMPLISHED

Here at Schumacher USA we just picked up the 2002 issue of *RC Touring Cars* and noticed an error in the "Electric Pro Touring Car Shakedown" article. It looks as if some of the

YOU SAID IT

"Why hasn't anyone come out with a mini Maxx truck?"

As I looked through the June 2002 issue of *RC Car Action* (the one with the mini tests), I thought, "Why hasn't anyone come out with a mini Maxx truck?" I figured that since minis and Maxxes are the hot things in RC right now, why not put the two together? I think it would be great to be able to set up an obstacle course in the living room and not have to worry about running your E-Maxx into the wall or sending it through a window. [email]
Justin Huffman

Only Traxxas could make a mini *Maxx*, but I see where you're going, and I think you're right: mini monsters would be a big hit. Along with a pint-size Traxxas truck, I'd love to see a Kyosho Monster-Z, HPI Micro RS4 MT, Tamiya Jugger-gnat ... the list is endless. Somebody needs to get on this!

—Pete

Each month, "Readers Write" sponsor Team Trinity awards the "You said it" letter writer the Reference body of his choice. This is Trinity's Stratus-Y shell.



WRITE TO US: We welcome your photos, drawings, comments and suggestions. Letters should be addressed to "Letters," Air Age Inc., *Radio Control Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606 USA. Letters may be edited for clarity and brevity, and each must include a full name and address or telephone number so that the identity of the sender can be verified. We regret that, owing to the tremendous numbers of letters we receive, we can't respond to every one.

- Peter Vieira: peteriv@airage.com
- George M. Gonzalez: georgeg@airage.com
- Bob Hastings: bohnh@airage.com
- Kevin Hetmanski: kevinh@airage.com
- Paul Onorato: paulo@airage.com
- Steve Pond: stevep@airage.com
- Greg Vogel: gregv@airage.com

YOUR BEST BUILDS



MIKE VILLENA
CHICAGO, IL
**TAMIYA ALFA
ROMEO GIULIA
SPRINT GTA**

READERS'
RIDE
OF THE
MONTH

Here's a Tamiya Mo2 chassis that has never looked better. Mike is a master at adding scale detail to a kit, and he doesn't miss an opportunity to give a model his personal touch. This Alfa now has a fully tricked engine compartment, interior and trunk—even a scale driver figure.



DOUG HARVEY, WAYZATA, MN
**CUSTOM TAMIYA
CLOD BUSTER**

Have you ever wanted to create an RC project that nobody else has? Doug did just that by incorporating a Clod Buster driveline into his own custom-built, brass-tube chassis. He lifted the unique Chevy Avalanche shell from a toy-store New Bright RC car; Doug disassembled the car, detailed the interior and reassembled the body atop his custom monster.

BRIAN GABRIO
AUBURN, WA
**TEAM
ASSOCIATED TC3**

There's something about a slammed pickup that makes it look like an instant hot rod. This that makes it look like an instant hot rod. This He upgraded it with the Team kit, and it also has HPI rims, Pro-Line V-Rage tires and a JR XR2 radio. It is powered by a 14T Speed Gems motor.



is Brian's TC3 Silverado; his wife refers to it as his "other girl." He upgraded it with the Team kit, and it also has HPI rims, Pro-Line V-Rage tires and a JR XR2 radio. It is powered by a 14T Speed Gems motor.

CORY L. SCHUMACHER
DES MOINES, IA
TRAXXAS T-MAXX

Some guy with the last name of Traxxas is probably driving a Schumacher right now. This is Corey's T-Maxx and his RC buds convinced him to send in the pictures. The truck has a Super Maxx EXT suspension kit with Progressive Suspension Piggy Back reservoir shocks and KO radio gear. He uses an OFNA Sport .21 pull-start engine in the chassis conversion.

The engine has a Dynamite pipe and a K&N air filter. The checkered F350 body is from Pro-Line, as are the Maxx Mulcher tires; the wheels are from MSJ. The truck has KO Propo radio gear, too. OK, Corey; it's time for your friends to send in pictures of their rides now!



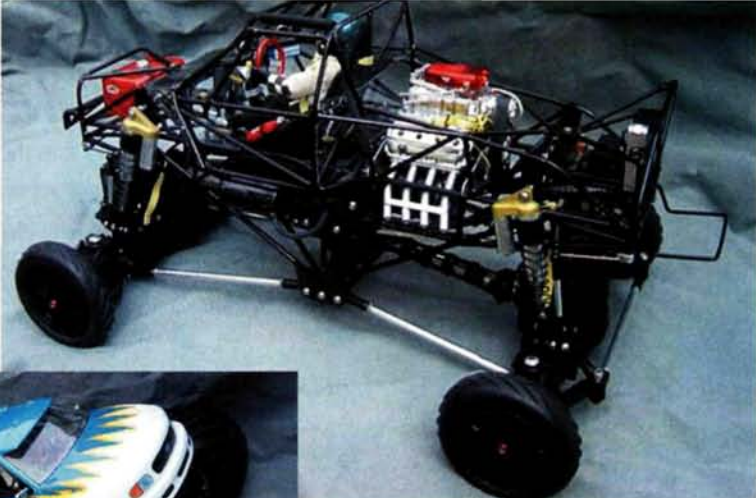
WIN A ONE-YEAR SUBSCRIPTION TO RADIO CONTROL CAR ACTION MAGAZINE!

Send a sharp, uncluttered, well-exposed color photo of your vehicle (no Polaroids) and a brief description to "Readers' Rides," *RC Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606 USA. If we publish your photo, you'll receive a free, one-year subscription to *RC Car Action* and will be eligible to win the "Reader's Ride of the Year Contest." Write your address and phone number on your letter and on the back of every photo you send. Good luck!

**DAVE PACK, RICHMOND, VA
TAMIYA JUGGERNAUT 2**

I think Dave chose the right name when he dubbed his Tamiya Juggernaut 2 "Overkill." The monster features a custom-built, brass-tube chassis, 4-link bar suspension, working drive-shaft hoops, spinning disc-brake rotors and a reverse-mounted tranny. A pair of Team Orion 16x3 motors with a 7-cell battery and a Novak ESC powers the truck, but they're hidden from view by the faux Parma Hemi engine.

Rounding out Dave's creation are Progressive Suspension Piggy Back reservoir shocks, Tamiya Bullhead wheels and tires and a Parma Big Foot body painted by Trick RC Paint Works. Dave even added his own "trailer" wheels that are just like those that the full-size monsters use to fit on their transporters.



**TONY VUE, STOCKTON, CA
HPI RS4 RACER**

Entering the world of RC was a natural progression from plastic models for Tony. His beautiful HPI Civic is powered by a Phantom .15 engine, and Tony has replaced all of the stock electrical wires with eye-catching yellow ones for more visual appeal when he removes the gold Honda body. He lifted the Performance Hobby stickers from a magazine and white glued them to the body.





MEL LUDLOW, SPRING, TX
TEAM ASSOCIATED RC10 T3

This Factory Team T3 is Mel's first RC vehicle and his first air-brush paint job, which he successfully pulled off using six colors of FasKolor paints. He followed tips given in this magazine and in the book "Painting and Finishing RC Bodies" to create his cool-looking stadium truck. The T3 features a Pro-Line Silverado body, Futaba radio gear and RPM bumpers.

RYAN BALL, MOORPARK, CA
TEAM ASSOCIATED
RC10 GT

Beauty is more than skin deep on this hot-looking Team Built RC10 GT. The O.S. .15 CV-powered truck has RPM suspension components, titanium turn-buckles, MIP CVDs, an O'Donnell racing head and Futaba radio gear. Ryan writes that his GT is fast enough to keep up with the 1/8-scale buggies at his track. The paint credit goes to TQ Paints in SoCal.



Congratulations to the Newest World Champions!



Masami Hirose
 2002 IFMAR 1/12
 World Champion
 Reedy Ti Modified Motor



Surikarn Chaidejsuriya
 2002 IFMAR Touring Car
 World Champion
 Reedy Ti Modified Motor

REEDY

The Power Behind
TWENTY-FOUR IFMAR World Champions!

How many World Champions use YOUR brand of motors?

**QUICK BRUSH REMOVAL**

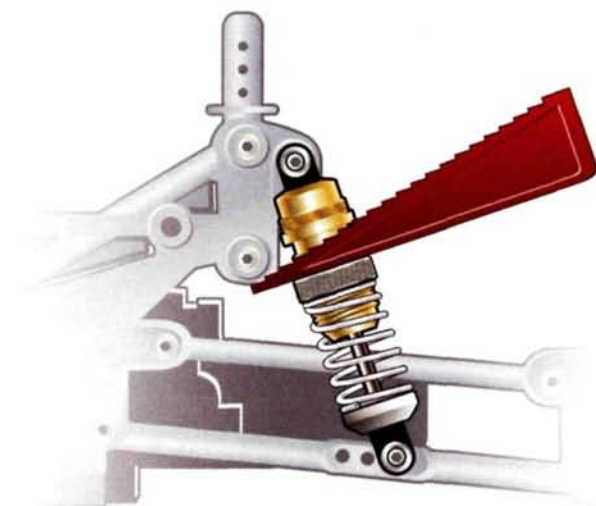
For faster brush changes, cut open the eyelet on the brush lead. Now, you can simply loosen the screw and slide out the eyelet to replace the brush instead of having to remove the screw entirely.

*Eric Weber
San Diego, CA*

DIRT-RESISTANT MOTOR

To keep the endbell of your motor free from dirt, wrap "Corban" (an elastic bandage material) around the end of the motor. It sticks to itself and comes in cool colors.

*Kenny Darmer
Houston, TX*

**EXACT PRELOAD MEASURING**

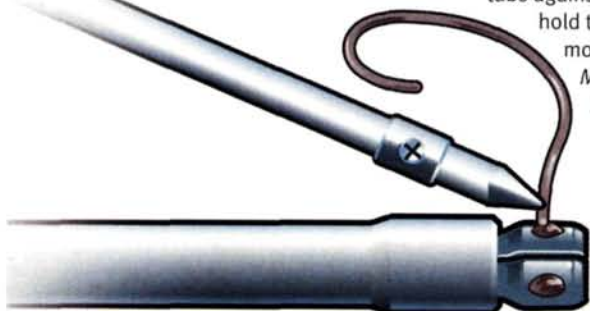
If your shocks have collars to adjust preload, try this for exact measuring. Use a sedan ride-height gauge, hold it between the collar and the top of the shock, and take the reading off the gauge. Then hold the gauge up to the other shocks, and adjust them to match the first reading. [email]

Lenny Zeldo

**REFURBISHED GLOW-IGNITER**

If your glow igniter does not hold onto the glow plug tightly, try this. Place some solder on the outside of each of the brass tabs. This will allow the steel sleeve to tighten the tabs against the plug and hold the igniter more securely.

*Marty Stewart
Lawrence, KS*

**MESS-FREE TIRE GLUING**

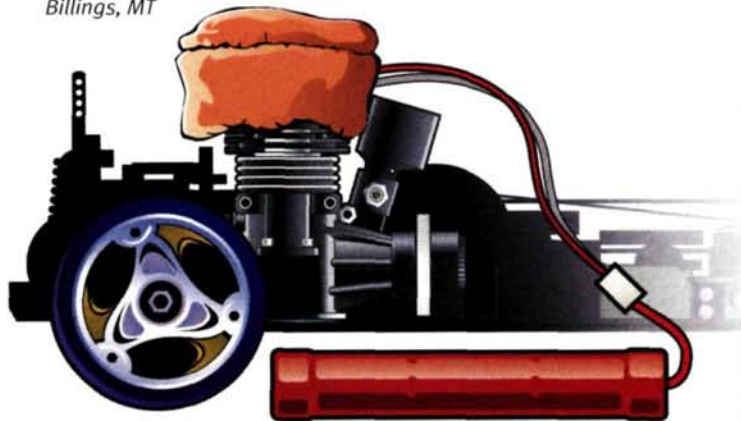
A cleaner way to glue tires is to install the tire on the rim but leave the edge out of the rim's groove. Apply a little slow-setting CA to the rim, then work the tire into the groove. The slow-curing CA will give you enough time to properly seat the tire.

*Bill Brice
Riverside, CA*

COLD-WEATHER NITRO STARTING

In cold weather, the engine of a nitro-powered vehicle may be difficult to start. Place a tire warmer over the head of the engine. When the temperature comes up, the engine will start much more easily.

Henry Meyers
Billings, MT



MAGNETIC ASSISTANCE

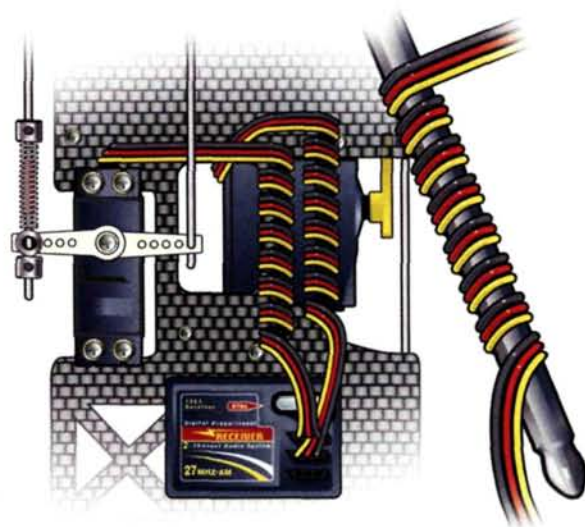
To magnetize your screwdriver, pass it over a motor a few times in one direction only. Now, when you need to install a screw into a deep recess, it will stay on the tip of your screwdriver and won't fall off.

Charles Jarrett
Laurel, MD

NEATER WIRING

This simple tip will make the wiring on your chassis look more professional. Use a screwdriver to wrap one of the wire leads tightly around the shaft. Slide out the screwdriver, and the wire will be nicely coiled for a neater look.

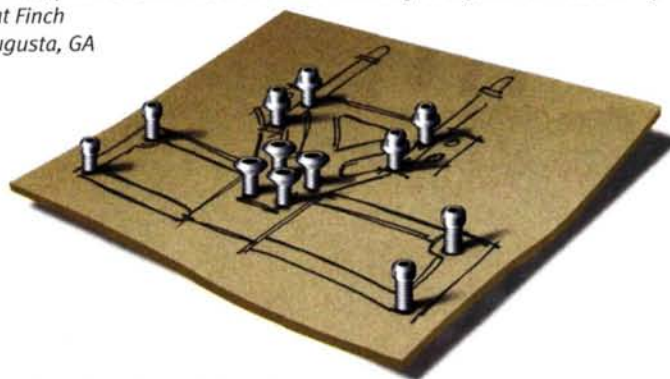
Robert Rudd
Indianapolis, IN



REASSEMBLING GUIDE

Before you disassemble complex parts of your car, use a piece of cardboard to draw the outline of the assembly you are working on. Put holes in the drawing to indicate the screw layout. As you remove the various screws, place them in the holes in the drawing as a guide for reassembly.

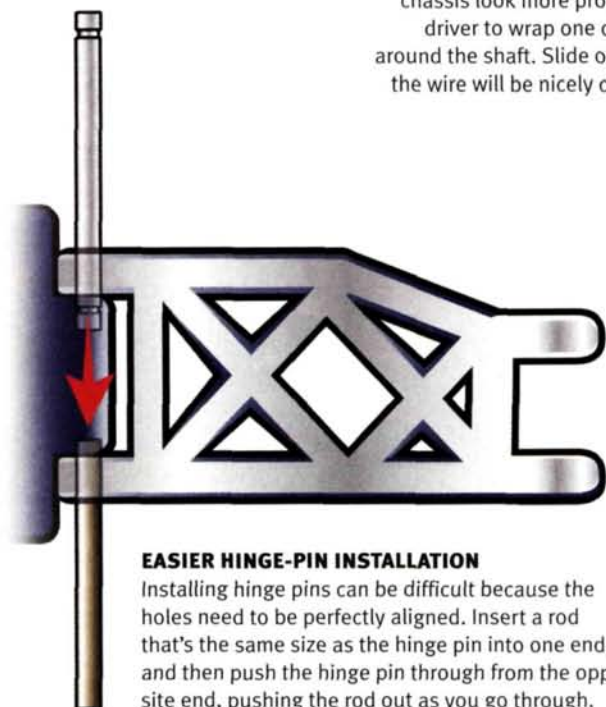
Pat Finch
Augusta, GA



EASIER HINGE-PIN INSTALLATION

Installing hinge pins can be difficult because the holes need to be perfectly aligned. Insert a rod that's the same size as the hinge pin into one end, and then push the hinge pin through from the opposite end, pushing the rod out as you go through.

Bryan Lloyd
Mesquite, AZ



"Pit Tips" are submitted by readers and are screened for functionality, feasibility and safety but are not tested by Radio Control Car Action.

Radio Control Car Action and the submitting authors are not responsible for personal injury or damage to models or tools resulting from readers' use of "Pit Tips."

WIN AN OFNA YO-YO AND RC CAR ACTION SUBSCRIPTION! Radio Control Car Action will give a 6-month subscription (or extend an existing subscription) and an OFNA Yo-Yo to the author of each idea used in "Pit Tips." The "Top Tip" winners will also be considered for "Tip of the Year" to be selected at the end of each year. The "Tip of the Year" winner will receive an OFNA OB4 International RTR electric car kit. Send a rough sketch to "Pit Tips," c/o Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606 USA. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO AND NOTE YOU SUBMIT. We're unable to publish many good tips because we don't have the sender's name and address. Please note: because of the number of ideas we receive, we can neither acknowledge every one nor return unused material.

YOU'VE GOT PROBLEMS? WE'VE GOT FIXES.

SMOKIN' HOT RUSTLER

I have a Traxxas Rustler with a Traxxas XL-1 ESC, and the motor and ESC get way too hot to touch after about 20 minutes of running. Everything (except for the tires and steering servo) is stock. I have two 1500mAh packs and two 2400mAh packs (I primarily use the 2400s). I just ordered a heat sink for the motor, but I was wondering whether you knew of any other tricks that might help my truck run cooler. Thank you! [email] Mark Whitney



Above: to check for drive-train binding, remove the pinion gear and then roll the vehicle on a flat surface. The truck should roll smoothly. **Right:** if binding is evident, check the wheel bushings to make sure that they are clean and well lubricated, and inspect the axle drive pins for hung-up pieces of grass or other debris.

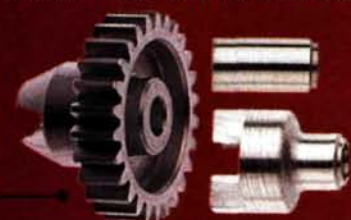


Just about any electric motor and ESC combination will get hot after 20 minutes of straight running—especially on warm days. Your Rustler will provide more than 10 minutes of running time with the stock motor and a fully charged 2400mAh battery pack. You should never run back-to-back battery packs without a short cooldown period in between. Let the motor and ESC cool down between packs, and you'll be able to run your truck all day.

Installing a motor heat sink is not a bad idea, but there are other ways to ensure that your electronics run cooler. Inspect the pinion and spur gear for a proper gear mesh. A tight gear mesh will cause the motor to strain, and that will cause overheating. To adjust the gear mesh, loosen the motor-mounting screws, then slide a strip of paper between the pinion and spur gears. Tighten the motor-mounting screws and remove the paper, and the gear mesh should be properly set. Gear down (install a pinion gear with fewer teeth or a spur gear with more teeth); this lowers your truck's final gear ratio, which in turn lowers motor rpm (your truck will lose some top-end speed, but it will accelerate faster). Make sure that your truck's drive train is operating smoothly without any binding, and install wheel bearings. All of these tips will help keep your truck running cooler and longer.

REAL PERFORMANCE PRODUCTS!**Traxxas Lightened Spur And Double-Disc™ Slipper Kits**

RRP's NEW line of Lightened Spur and Double-Disc Slipper Kits for Traxxas Nitro and T/E-Maxx trucks are designed to improve performance and increase reliability. This combo incorporates a machined steel or Super-Tough plastic spur, a Vented Aluminum Clutch-Plate/Gear Adaptor (small or large), 2 Slipper Pads and 2 Plates to deliver the adjustability you need and the increased performance that you demand. **Complete Slipper Kits** are available in the following sizes: RRP 8166 Slipper Kit with 66T Super-Tough plastic spur (Stock Size) for E-Maxx RRP 8172 Slipper Kit with 72T Super-Tough plastic spur for Traxxas Nitro RRP 8465 Slipper Kit with 65T Steel Spur for Traxxas Nitro RRP 8472 Slipper Kit with 72T Steel Spur (Stock Size) for T-Maxx. Spurs, Clutch-Plate/Gear Adaptor and Slipper Pads also sold separately.

T-Maxx Forward ONLY Hardened Gear Kit

This kit contains a 26T hardened aluminum output gear, a forward drive hub adaptor and spacer. RRP 8585

Nitro and T/E-Maxx Accessory Spurs

A wide range of spurs fit our Double-Disc Slipper Kits. Choose from machined Super-Tough plastic spurs in 66, 68, 70, 72 and 76T sizes, RRP 82XX, or CNC machined steel spurs available in 65, 72 and 76T sizes, RRP 83XX. Small Clutch Plate/Gear Adaptor fits 65 thru 70T spurs. Large Clutch Plate/Gear Adaptor fits 72 thru 76T spurs.

Traxxas Nitro Hardened Steel Clutchbells

CNC Machined from solid steel these bells are built to last. They take the 5x11 bearing (NOT included). Available in 19T, RRP 8119, 20T RRP 8120, 21T RRP 8121 and 23T RRP 8123.

T-Maxx Hardened Forward Primary Gear

Machined from solid aluminum and hard coated. A direct replacement for the stock gear. RRP 8528

48P Absolute Series Pinions

Super hard, lightened and cut with unmatched precision. Great with any spur, but with an Absolute spur, even on off noise is gone! Available in 48P in 16T thru 28T sizes, RRP 1416 - RRP 1428.

48P / 64P SuperLite Aluminum Pinions

They're lightened, hard coated and precision cut. Available in 48P in 16T thru 28T, and 64P in 24T thru 38T. RRP 30XX (48P) and RRP 31XX (64P). Only \$5.25

48P Hard Nickel Plated Steel Pinions

These precision cut gears have an extremely hard coating that makes them really last. Available in 12T thru 35T. RRP 1012 - RRP 1035

Make No Compromises.

www.robinsonracing.com

MUCH NEEDED LOW-END NEEDLE-VALVE ADJUSTMENT

I am having trouble with the brakes on my DuraTrax Maximum ST. The truck stops when I apply the brakes, but the engine stalls if I keep the brake on for more than 1 second. I have a Hitec throttle/brake servo that appears to be working fine. I adjusted the idle stop screw to make the engine idle a little higher, but that didn't work, either. Do you have any advice for me?

Nick Gunderson
Ham Lake, MN

It doesn't sound as though your engine's low-end needle valve is adjusted properly, Nick, so here's a simple way to do it. First, get your engine up to running temperature by driving your truck around for a couple of minutes. Next, rev the engine to clear the excess fuel out of the carburetor and then pinch the fuel line approximately 3 inches from the fuel-line pickup. Listen to how the engine responds; ideally, it should start to rev up and then sputter after the fuel line has been pinched for approximately 3 to 4 seconds. If the engine starts to rev but sputters out immediately—within 1 or 2 seconds—the needle valve is set too lean. Richen the air/fuel mixture by turning the low-end needle valve counterclockwise about $\frac{1}{8}$ turn. Conversely, if the engine does not respond for 5 seconds or more, the air/fuel mixture is set too rich. Lean it out by turning the low-speed needle valve clockwise $\frac{1}{8}$ turn, and then repeat the test.

To achieve proper engine idle, you'll probably need to adjust the idle stop screw after you've adjusted the low-end needle valve. Turn the idle stop screw clockwise or counterclockwise as needed to provide a smooth and consistent idle. If you follow these tips, your engine should be able to idle for more than 30 seconds without stalling with the brakes applied.



Left: pinching the fuel line that feeds fuel to the carb and then listening to how the engine responds is the easiest way to adjust your carb's low-end needle valve. **Below:** turn the low-speed needle-valve adjustment screw clockwise to lean out the air/fuel mixture or counterclockwise to richen it. Turn the idle stop screw (arrowed) clockwise to raise the idle and counterclockwise to lower it.



NEW T-Maxx Steel Diff Gear Set



T-Maxx / E-Maxx differential gear set, includes: 1 beveled pinion gear, 1 beveled spur gear, 4 re-usable stainless steel phillips head screws, 1 tube Associated Black Grease, and a shim kit for spider gears with 10 .003" shims. 2 sets needed per truck. RRP \$590

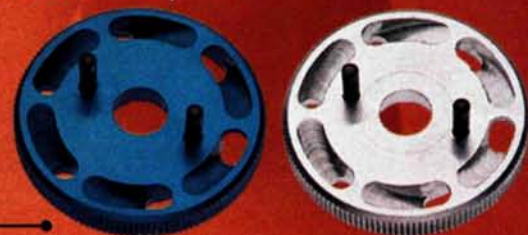
NEW T-Maxx Aluminum High Performance Brake Kit



New, lightweight aluminum high performance brake kit, includes bigger, more aggressive brake pads and steel backing plates. One piece vented rotor minimizes side-to-side wobble. RRP \$560

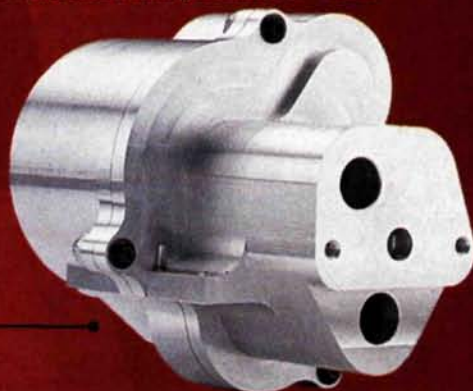
www.robinsonracing.com

T-Maxx Vented Flywheels



Aluminum vented flywheels move air over clutch bell, improving performance and cooling. RRP \$551 Blue, RRP \$550 Natural Silver

Forward ONLY Racing Gearbox For T-Maxx



Precision CNC machined from aircraft grade billet aluminum this Forward ONLY Racing Gearbox will give your T-Maxx a serious competitive edge. RRP \$595

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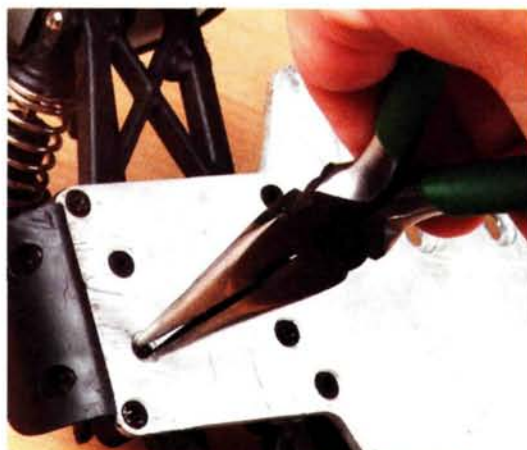
SNAPPED SCREW HEADS

I have a Traxxas T-Maxx that's equipped with Traxxas aluminum bulkheads. I noticed that two of the four screws that secure the chassis to the front bulkhead have snapped off the screw heads, and the threaded part of the screws is stuck in the bulkhead. How can I get the leftover stubs out of the bulkheads? I've also noticed that the screws that secure the front and rear skidplates to the bulkheads and the lower braces to the transmission keep loosening, even though I have applied thread-lock to them. I've attached a photo so you can see exactly what I mean.

Dean Martin
Chicago, IL

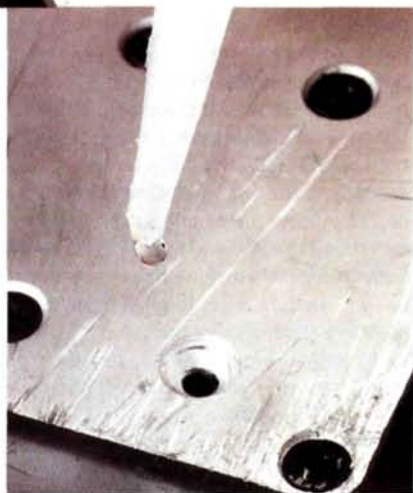
Thanks for the photo, Dean; it's a big help. It looks as if one of the two snapped-off screws could be gripped with pliers or vice grips and then threaded out. Unfortunately, the other screw is really in there! You'll need a rotary tool equipped with a cutoff wheel to slot the screw stud deep enough to be able to remove it with a thin-tip, flat-blade screwdriver. Another option is to use a screw-extracting tool that can be found in most hardware stores. If you can't get the stud out, you'll need to replace the bulkheads. High-quality hard steel or titanium machine screws will hold up better and might prevent this from happening again.

Apply high-strength liquid thread-lock on the machine screws that secure the skidplates to the bulkheads, and tighten the screws as much as possible. Check these particular screws after every other tank of fuel to ensure that they don't loosen and fall out. In fact, as standard protocol, you should check all of the truck's fasteners after every couple of runs. If you can't tighten the screws that secure the lower braces to the chassis and transmission, there's a good chance that the screw-mounting holes in the molded transmission case have stripped. Remove the transmission from the vehicle and apply a few drops of CA into the screw-mounting holes on the bottom of the tranny case. Let the CA cure for a few hours before you reinstall the transmission and lower braces on the chassis. The machine screws will tap new threads into the tranny case when you thread them in, and this will allow you to tighten the screws securely. This quick fix may not be permanent, but it will get you rolling while you wait for that new molded tranny case you ordered from your hobby shop.



Left: if the stud is exposed, you might be able to grip it with pliers and then back the stud out of the bulkhead.

Below: you can temporarily fix a stripped screw hole in any molded component by applying a couple of drops of CA glue to the holes.



RS4 Nitro Aluminum Brake Kit



Lightweight aluminum, variable braking system. RRP 1575

RS4 Nitro Vented Flywheel



Aluminum vented flywheels move air over clutch bell, improving performance and cooling.
RRP 1570
RRP 1571 Pull Start

Stealth Sedan Spurs



These precision machined spur gears are super quiet. They're available in 48P in 60T thru 96T sizes, and fit any HPI electric car or truck.
RRP 1860 thru
RRP 1896.

RS4 Nitro Small Aluminum Drive Pulleys



Hardened drive pulleys, sold in pairs.
RRP 1538

RS4 Top Shaft Pulley



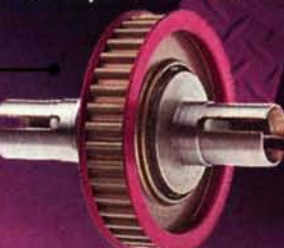
One piece pulley and shaft are precision cut and hard anodized. Purple anodized side flanges are pressed on. RRP 1527

RS4 / Pro / Pro2 / Nitro Aluminum Outdrives



40% lighter than stock ball diff outdrives. RRP 1585

RS4 Complete Ball Diff Units



Hardened steel outdrives, ground and polished thrust washers, 2 5x8mm ball bearings, and aluminum pulley.
RRP 1590 Electric
RRP 1595 Nitro

RS4 Diff Pulleys



Precision machined, hard anodized aluminum diff pulleys.
RRP 1539 nitro sedans
RRP 1528 electric sedans

RS4 Nitro Lightened Gear Adapter



This lightened gear adapter includes a machined nylon spur that's tougher than the stock gear and will last longer.
RRP 1535

www.robinsonracing.com

RS4 Nitro 32 Pitch Conversion Kit is available. RRP 1536

TIME TO CLEAN THE COMM

I hope you can help me; I'm having a problem with my Team Associated T3 racing truck. Sometimes when I squeeze the throttle trigger, the truck just sits there until I give it a little shove. The Trinity Chameleon motor works fine for a while, but then the problem recurs after a couple of minutes of running. The guy at the hobby shop said that I need new motor brushes. Will that solve my problem? [email] Sean Cook



It's easy to tell which of these two brushes is the new one and which needs to be replaced.



An inexpensive comm stick is all you need to clean the surface of the commutator.

It sounds as though it's time to clean and maintain your motor, Sean. Remove the left and right brush springs from the motor so you'll be able to slide them out of the brush hoods for inspection. If the brushes are chipped, damaged, or less than 5mm long, it's probably time to replace them. Simply remove the mounting screws that secure the brush eyelets to the brush hoods and then install new brushes. It's also a good idea to replace the brush springs at this point; they

only cost a couple of bucks, and they probably need to be replaced, too.

Before you install the new brushes and springs, liberally spray motor cleaner inside the motor can to expel all the carbon deposits, dirt and grime. While the motor commutator is still damp with motor spray, install a comm stick inside one of the brush hoods, and hand-turn the motor counterclockwise several revolutions while applying pressure to the comm stick (having the pinion gear installed on the motor shaft will make spinning the armature much easier). Spray a little more motor cleaner into the motor after you've cleaned the surface of the commutator with the comm stick to remove any residue left over from the cleaning process. Reinstall the brushes and brush springs, apply motor bushing and bearing oil to the motor bushings, and your motor should be good to go. It's a good idea to break in the motor by hooking it up to a 4-cell battery pack and letting it run for a few minutes before you reinstall it in your truck.

TOOLBOX

TAMIYA CAMBER GAUGE

Tamiya's camber gauge is molded of thick plastic and feels durable. Small feet on the bottom keep the gauge resting upright when you make camber adjustments. The gauge does not have a thumbscrew to lock the angle setting, but it is assembled so that it has enough friction to hold its position. Molded into the front "window" and rear of the tool are graduated degree lines with numbers ranging from -10 to +10 degrees. This is a must-have for your pit box for chassis adjustments.

Tamiya camber gauge—item no. 49225; \$18.50.

Tamiya America Inc.
(800) 826-4922;
tamiya.com.



NEED HELP?

Send your "Troubleshooting" questions and comments to George M. Gonzalez, georgeg@airage.com.

RC10-GT Steel Combo



Precision machined from solid steel, then hardened, this 65T spur and 15T bell combo will last and last. The extra-hardened clutch bell fits ALL Associated and MIP shoes. RRP 2365

www.robinsonracing.com

Hardened Steel Idler Gear



Cut from solid steel stock, this gear is lightened and hardened for super quiet precision and extra long life. Jammin' tranny grease is included. RRP 2213 RC10-GT, RRP 7505 Ultima GP-R

Associated Titanium Stealth Top Shaft



CNC Machined from solid titanium, this super hard, super light top shaft will fit any Stealth transmission. RRP 1512.

Hardened Diff Gear



Hard anodized, precision CNC machined aluminum diff gear. RRP 1513 RC10-GT RRP 7500 Ultima GP/EP-R

Blue Lightened Slipper Kit



The rear plate is hard anodized and the front plate is color treated. The front plate holds the pad forcing it to slip on the rear plate. When pad wears, just flip it over for a new surface. RRP 1515 Associated, RRP 7515 Kyosho Ultima

Aluminum Outdrives



40% lighter than stock ball diff outdrives. RRP 1475 TC3, RRP 1502 B3/T3

TC3 Ultra 48 Pitch Spurs



Precision machined from heat-resistant plastic, these spurs mesh flawlessly with our pinions. Available in even numbers from 70T thru 80T, RRP 1670 RRP 1680.



ROBINSON RACING PRODUCTS

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HOT NEW NOW

100 must-have items for 2003

BY THE RC CAR ACTION TEAM

The calendar still says "2002," but for the many manufacturers that make RC great, it's already 2003. This is the time of year when all of the latest cars, trucks, parts and tools for the coming year hit the trade-show circuit or are zapped out to the world via press releases. We've collected all the new gear we could find to give you a crystal-ball look at what's to come, and we've supplied item numbers (when available) and prices (which vary with dealer). Start shopping!



This is the stuff that's sure to draw a crowd at the shop (or when you show up with it at the track).



New technology is always part of the ever-changing RC scene. These are the products that push the limits.



The 10 most-viewed items (at presstime) from radiocontrolzone.com earned this badge of honor.



See more at rccaraction.com! Download video, or scope bonus pics—then discuss all of the new products on our bulletin board.

PHOTOS BY PETE HALL

ASSOCIATED RC10B4

Associated showed this stunning B4 prototype in Chicago. The all-new design recycles none of the B3's parts and is Associated's most inspired buggy design to date. Here are its primary features—straight from designer Cliff Lett:

- **New 2.6:1 reduction Stealth transmission.** Uses the same higher torque capacity differential as the RC10GT. The entire transmission assembly has been optimized into an ultra-compact package and is now an integral part of the chassis/suspension structure.
 - **Double-sided slipper-clutch assembly with higher torque capacity.** This allows a finer adjustment range and more efficient slipper operation.
 - **Super-low center of gravity.** The motor, battery, body, wing and even shocks have much lower mounting positions. This gives the B4 buggy a much lower CG for higher cornering speeds and more stability when tackling bumpy sections and jumping.
 - **New front and rear wheels.** The front wheel is stiffer and has a new offset and uses wide-body type. The new rear wheel is now interchangeable with other manufacturers' buggies; now spec tires can be pre-mounted and standardized for the most popular racing buggies.
 - **Longer MIP CVD axles.** Longer CVD dogbones and axles have been incorporated into the rear suspension to push the B4 out to maximum legal width and increase rear traction.
 - **Optimized front suspension/steering assembly.** The new forward-swept front suspension was designed in conjunction with the "co-planer" Ackerman steering geometry. This design allows maximum front-end clearance and minimum bump-steer while maintaining correct buggy Ackerman settings.
 - **In-line or trailing front axles.** Either in-line or trailing front-axle steering blocks can be used while maintaining correct axle and Ackerman positions.
 - **Symmetrical suspension arm design with captured hinge pins.** All four suspension arms are the same length, and the suspension hinge pins are captured so that no E-clips are used.
 - **Most adjustable RC10 ever.** All suspension settings can be easily accessed. The upper suspension arms have vertical ball studs in the front and rear so that fine roll-center and camber-rise changes can be made.
 - **Impact-absorbing wing mounts.** The rear wing has two impact-absorbing mounts that also support the rear-suspension assembly. The wing angle is adjustable.
- No item no. or price yet, but you can expect the B4 to be competitively priced!**



TRINITY D5 Flatliner Motor

The latest D-series mill is built around Trinity's revolutionary "FlatWire" technology, which allows for a lower polar moment of inertia (that means more punch and quicker spool-up on the track). According to Trinity, the increased surface area of FlatWire against the armature web saturates the armature laminations to a greater degree than is possible with round wire. The result is a more powerful, more efficient armature for the same number of turns as compared with round wire.

The D5 also has a new endbell that features an external circuit board and hard-wired capacitors. This eliminates any glitching from dirt getting under the heat sinks, and the capacitors are much easier to inspect. A new can with better-cooling "turbine" venting is the finishing touch.

Various item nos. depending on wind. \$95 each.



PRO-LINE 1947 Dodge Power wagon

The Dodge Power Wagon trucks were known for their rugged construction and versatility (ask your grandpa), but all we know is that the vintage sheet metal still looks cool. Since this is a Pro-Line shell, overspray film, window masks and decals are included.

Item no. 3138-00 \$28.

OFNA 9.5 MBX

The newest 9.5 gets the same orange-and-d treatment as OFNA's new Titan big-wheeler, and it borrows the monster's .25 powerplant. The suspension is new, too, with a pivot-ball upper and lower A-arm setup at each corner. As with all of OFNA's RTR big buggies, the 9.5 MBX includes an aluminum tuned pipe and manifold, full bearings, glow starter, fuel bottle and a factory-finished body.

Item no. 34955 \$515.

**COMPETITION ELECTRONICS Turbo 35 GFX**

For 2003, the Turbo 35 charger/discharger has a new look, and it features a new graphic display that shows charge and discharge curves. A rotary dial makes setup easier, and the GFX can now handle higher charge and discharge amp rates, and powers motors at up to 20 amps.

Item no. CE13760 \$629.95.

**CORALLY USA Automatic Tire Truer**

The new lathe from Team Corally can true 1/8-, 1/10- and 1/12-scale tires, thanks to full-range wheel adapters (sold separately). The 12V unit is easy to use and fully automatic, and it can even add up to 2 degrees of "cone." A tire diameter indicator makes it easy to monitor tire size.

Item no. 15012 \$399.

**DYNAMITE Prophet Peak Chargers**

Dynamite has revamped its charger line with the Prophet series. Three models are offered: Prophet, Prophet Plus and Prophet Pro. The DC-only Prophet charges 6 or 7 cells at 4 amps; the Plus adds AC power and charges 4 to 7 cells at 1, 2, or 4 amps; and the Pro is a DC-only unit that charges receiver packs at as little as 0.1 amp and sub-C packs at up to 5 amps. All of the Prophet chargers are Ni-Cd and NiMH compatible.

Item nos. DYN4008 (Prophet) \$24.99;

DYN4036 (Prophet Plus) \$39.99;

DYN4047 (Prophet Pro) \$49.99.

**VENOM RACING Magnetic Mounted Tires**

Venom's new mounted-tire line brings together street-style 26mm wheels and radials. A chip-resistant plating process helps the chrome look last, and four styles are offered (left to right): Nitrous, Speedster, Twisted and Zurg.

Item nos. 1040MC (Nitrous) 1041MC (Speedster) 1042MC (Twisted) 1043MC (Zurg) \$22/4 pack.

**TRINITY Reflex NT Pro**

The Reflex NT is well equipped right out of the box, but if you just gotta have every go-fast widget, the new Reflex Pro is for you. The kit includes aftermarket parts worth more than \$450, including: front one-way diff; vented disc brake; aluminum hex adapters; stiffer composite suspension components; aluminum brake lever; front and rear roll bars; Centax clutch; Big Bash bumper; pivot-ball-shock upper mounts; aluminum front shock tower and more.

Item no. NT1001 \$699.99.



TEAM ORION V2 Modified Motor

If Team Orion has its way, brushed motors will never be the same. The new V2 mods feature cylindrical brushes that are loaded into a machined-aluminum endbell. The brushes are angled down toward the commutator (think of the letter "V"—no doubt the inspiration for the "V2" name). Although each brush has a round cross-section, the brush face is elliptical because it meets the comm at an angle.

Orion's surface-mount capacitors have returned, along with a new clamped-in Schottky diode. Ports in the endbell are sized to accept 12-gauge wire, and a setscrew clamps the wire for a full-contact fit without solder. Tapped holes allow you to mount a miniature fan (the latest rage in Europe). It's trick!

Various item nos. depending on wind. \$95.



KYOSHO New Mini-Z sedans

The Mini-Z chassis isn't new, but Kyosho is always cooking up new looks for this tiny performer. Here are the latest: Ferrari F40, Ferrari 355, Subaru Impreza WRX, Mitsubishi Lancer and Mercedes CLK Original Teile.

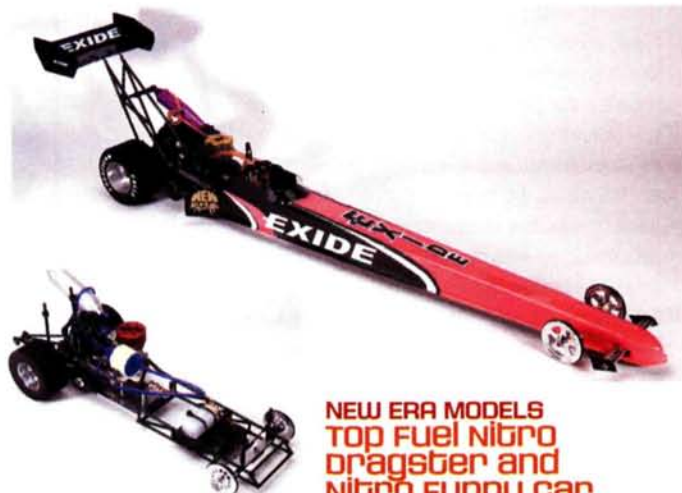
Various item nos. \$140.



TAMIYA ENZO Ferrari TB-01

You red-car fans (and who isn't a red-car fan?) will definitely dig Tamiya's stunning Enzo, which relies on a shaft-driven TB-01 chassis for motivation. No expert-built RTR option on this one yet; it's a ground-up, clear-body kit. If you haven't ever built a kit, the Enzo would be a great first project; nothing builds like a Tamiya.

Item no. 58298 Price not yet determined.



NEW ERA MODELS Top Fuel Nitro Dragster and Nitro Funny Car

Both of New Era's straight-line machines have a high-strength chromoly chassis. The 1/10-scale rail is ready to accept small-block power, or you can opt for a .21 conversion kit. The 1/8-scale Funny accepts a big-block .21, and both cars can be outfitted with optional 2-speed transmissions.

Item nos. NTF101 (Dragster) \$499.95; NFC153 (Funny Car) \$549.95.



FANTOM FR Engines

Fantom's FR .12, .15 and .21 engines feature ABSC technology; the sleeve is still brass and the piston is still aluminum, but the sleeve coating is new: silicone carbide, a super-hard, super-slick material that outlasts chrome in the demanding environment of a high-revving 2-stroke

engine. The FR .21 is a rear-exhaust, and the FR small-block engine is a side-exhaust—for now; a Fantom rear-exhaust .12 will be available soon. Additional features shared by all the FRs include 2-needle carbs, race-ported lightweight cranks, high-performance connecting rods and pistons with oil groove, included glow plugs and air filters.

Item nos. and prices vary with configuration. (FR .12) \$172 to \$220; (FR .15) \$208



TEAM LOSI Triple-XS and Triple-XT sports

Team Losi scored big with the RTR Triple-XNT Sport RTR, our 2002 "Truck of the Year," and now the Losi guys have turned their attention to electric RTRs. The Triple-XS touring car and Triple-XT race truck are the first to get the Sport treatment, which includes complete factory assembly (right down to glued tires), a painted 3-color body, a JR XR2 radio system, GM Racing V3R reversing ESC, full bearing set and 19-turn motor.

Item nos. LOSA0280 (Triple-XS) \$269.99; LOSA0090 (Triple-XT) \$269.99.

IT'S ALL ABOUT THE TRUCKS!



TEAM ASSOCIATED Monster GT

Associated definitely surprised us all with the Monster GT! The all-new, 4WD truck features pivot-ball, 8-shock suspension, an extruded-aluminum chassis, a 2-speed reversing transmission, a factory-painted body and big-block .21 power with both pull-start and shaft-start capability. We haven't parked one side by side with an OFNA Titan or an HPI Savage yet, but the MGT appears to be the biggest monster truck currently available. Check out "First Look" on page 108 for all the details.

\$499.

TRAXXAS SportMaxx

Fresh on the heels of the newest T-Maxx (see the November 2002 issue for our "First Drive" feature), Traxxas has unveiled the SportMaxx. The "sport" concept might make you think the engine is less powerful, but the SportMaxx is powered by the same high-output TRX 2.5 engine with EZ-Start 2 as the freshly minted T-Maxx. What makes the newest member of the Maxx family a "sport" truck is 2WD (the standard Maxx's front differential, center shaft and drive axles have been removed), and its simplified transmission—a forward-only, single-speed unit. Otherwise, the SportMaxx has all the latest Maxx features: a 3mm chassis; a wide-track, beefed-up suspension; adjustable caster; new-look bodies; and the TRX 2.5 powerhouse engine.

Item no. 5110 \$350.



OFNA Dominator Extreme

The OFNA Dominator, a more athletic version of the Monster Pirate, is now available in an aluminum-everything Extreme version. In addition to the blue-anodized trinkets, OFNA's super-luxe truck includes raceworthy tires and the latest 8-port Hyper engine, so the new Dominator should be as fast as it looks.

Item no. 14345 \$900.

HPI Savage

With its unique TVP (twin vertical plate) chassis, there's no mistaking the Savage for any other monster. Big-block Nitro Star power is standard, as is a factory-painted and decaled body, 2-speed tranny, slipper clutch, high-torque steering servo, 160cc fuel tank and eight of the longest shocks we've ever seen. You can find out more in "First Look," on page 100.

Item no. 831 (RTR Savage .21 truck with Nitro GT-1 truck Body) \$450.



TAMIYA Wild Commando Nitro

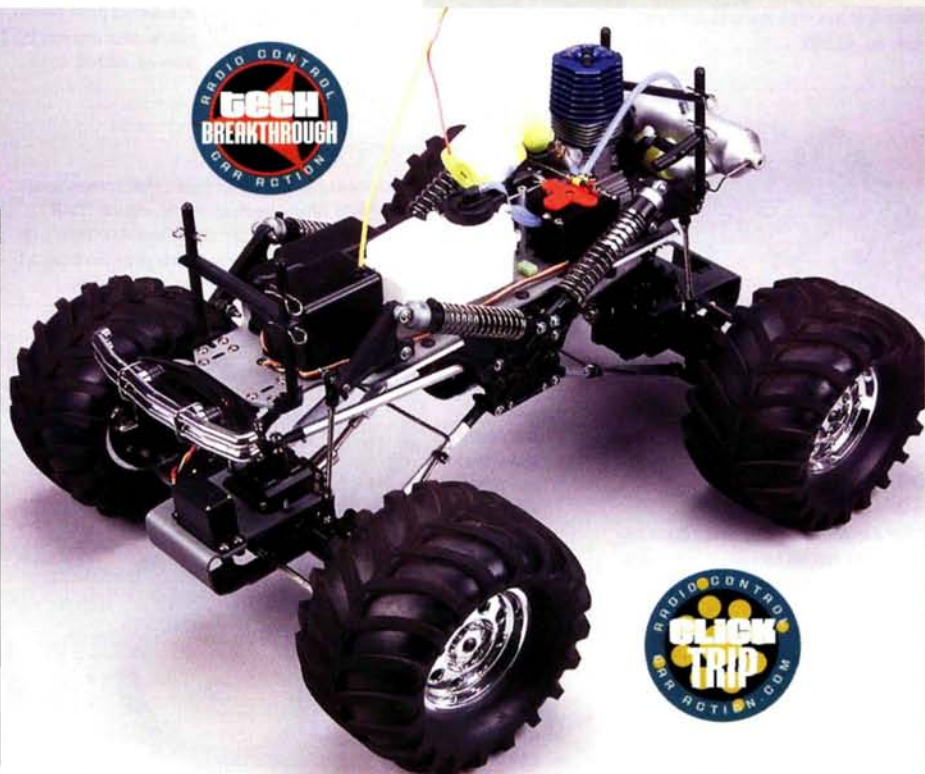
The Terra Crusher has been spun into this military-theme monster, which wears Tamiya's new low-profile Tarmac tires, wheels and can't-miss-it camo bodywork. The fighting machine also has a gunmetal-colored chassis and a new heat-sink head, but otherwise appears unchanged from the Terra Crusher formula.

Item no. 43503 \$410 (estimated).

XTM RACING X-FACTOR

XTM has revealed its mystery truck, the X-Factor. The new monster is the first to bring a solid-axle, 4-link suspension system to nitro trucking, and it's a burly machine. XTM's own .247 extra-big-block, pull-start engine spins the steel-gear transmission, which has a slipper clutch and auto-shifting 2-speed transmission with driver-selected reverse. The XTM R-Box electronic mixer makes full braking and reverse control possible with a 2-channel radio. We'll have a "First Drive" in the next issue!

Item no. 145641 \$450.





HOT BODIES Tornado RTR

We've seen this car in various stages of development at the Shizuoka and Nuremberg shows, and now Hot Bodies is ready to release it as the Tornado. Standard equipment includes: a 2-speed tranny; tuned pipe; ball bearings; painted, trimmed and mounted body; factory-glued tires; and a competition-type, pivot-ball suspension. All the support gear is included, too; you get a fuel bottle, glow starter, AA batteries and plug wrench.

Item no. HB55100
\$336.



OFNA Hyper starter box

OFNA's definitely got something different with this box. The injection-molded case is configured for use with the Hyper 7 buggy, but it can be adapted for many other applications as well. A 12V gel-cell or pair of stick packs can power the box, and it may become standard equipment on a Hyper 7 RTR in the future.

Too new for item no. and price!



LRP Pulsar

LRP's fully adjustable Pulsar is the choice of world champions Matt Francis, Surikarn Chaidajuriya and Atsushi Hara. The DC-only unit allows you to change the charge amperage while charging in linear mode or flex mode, and it is fully compatible with all types of NiMH and Ni-Cd batteries. The Pulsar can also discharge and cycle packs at up to 10 amps, and it can be used to operate motors for break-in or to power lathes and DC soldering irons at up to 9 amps. There are many more features—too many to list here!

Item no. 41550; \$200.



PARMA Faskolor F-1 Airbrush set

The number-one name in water-based polycarbonate paint now has an airbrush to spray it! Parma's Faskolor F-1 set includes a high-quality, dual-action airbrush with siphon feed, air hose and a 4-ounce paint bottle. The screw-on, siphon-feed cap is threaded to fit Faskolor paint bottles, so you can spray straight from the bottle. A molded, hard-plastic case protects the F-1 between painting sessions.

Item no. 40260 \$110.



MDP 2000mAh NiMH AA Cells

MDP has somehow squished 2000mAh into an AA cell, so now you can run even longer before your radio sounds the low-voltage alarm. The MDP cells are also perfect for your HPI Micro RS4 when you use the Micro's included 4-cell AA holder, or for powering any other electronic device.

Item no. 10197 \$18/4 pack.

TEAM LOSI Triple-X4

Team Losi's new four-wheeler is already a winner; Matt Francis used one to TQ the IFMAR World Championships and to win the ROAR Nationals! The new buggy is based on the single-belt drive train originally developed for the Triple-XS touring car, which gives the Triple-X4 an easy-to-work-on layout with quick diff access and zero belt exposure to track debris. Hard-anodized shocks, full ball bearings, dish wheels with soft compound racing tires and genuine MIP CVDs are all standard features. Losi jump-started the 4WD scene with the original Double-XS and is poised to do it again with its newest X-machine.

Item no. LOSA0014
\$270.





KYOSHO Ultima ST GP Evolution

The new Evolution replaces the Type-R truck as Kyosho's flagship racing machine in the nitro stadium truck class. It's a fully loaded machine that includes many items that were previously available only as options for the Type-R. Here's the short list of upgrades: blue-anodized aluminum chassis; nose plate; standoffs; titanium-nitride shock shafts; alloy rear-suspension mounts; thicker, stronger graphite composite bulkheads and shock towers; 4mm transmission top shaft; and a Pro-Line Crowd Pleaser body.

Too new for item no. and price.

FANTOM RACING Works Pipes

Steel construction separates Fantom's Works pipes from the competition's. In addition to a much greater dent resistance, the steel pipes have a killer sound and look totally trick—either in chrome or with the "raw" look. Each hand-made pipe has its own serial number.

Item nos. FTMF033 (natural) \$59;
FTMF034 (chrome) \$63.



TRINITY Monster Horsepower Stocker

According to Trinity, its new Monster motors use a new armature-lamination design that "fools" the motor into thinking it has more than the ROAR-mandated 24 degrees of timing. The arm is lighter, too, for a quicker acceleration than previous high-RPM armature designs, and the motor uses the same external circuit board with hard-wired capacitors as the new D5. A Pro version with zapped magnets, a diamond-trued commutator, 4499 brushes and a dyno readout is also available.

Item nos. RC2140 (Stock) \$39.99;
RC2141 (Stock Pro) \$39.99.

Carbon fiber handles, drill blank wrench tips and hard anodized nut drivers make these the nicest tools in R/C. Each set comes in pouch and includes only the most popular sizes.

TK4000, Inch Allen Wrench Set
.050, 1/16, 5/64 & 3/32" in pouch, \$85.00

TK4001, Metric Allen Wrench Set
1.5, 2, 2.5 & 3mm in pouch, \$85.00

TK4002, Inch Nut Driver Set
3/16, 1/4, 11/32 & 3/8" in pouch, \$118.50

TK4003, Metric Nut Driver Set
5, 5.5, 7 & 8mm, \$118.50

TK4004, Reflex Pillow Ball Wrench
Fits Reflex NT, \$21.99

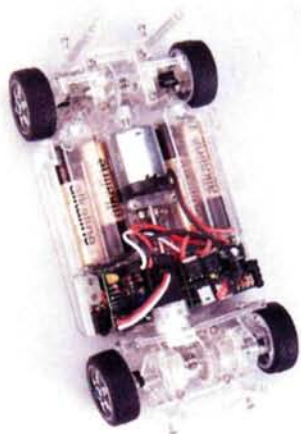
TK4005, Carb Tuning Screwdriver
\$21.99

TK4006, Kinwald Tool Pouch Only
\$22.99



By Kinwald
Carbon-Tech Tools

TRINITY



QJET Mini-Q

This car is clearly unique (groan). The Mini-Q's see-through chassis shows off its front and rear ball differentials. Check out the motor: the output shaft reaches out of the can all the way to the front diff; in effect, the motor is wrapped around a drive shaft! The 1/24-scale Mini-Q has a unique suspension, too—fully independent with droop screws. QJet distributor GoldScallop offers the car in three trim levels: Basic (chassis and clear body), Extended (chassis with painted body, servo, ESC and 27MHz receiver) and Ready to Run.

Item no. SE (Basic) \$35; EX (Extended) \$100; RTR (Ready to Run) \$130.



MEGATECH Aluminum Hop-ups

Megatech has gone gaga for aluminum, and it offers enough parts to replace virtually every hunk of black plastic on your Tamiya Terra Crusher, Associated Nitro TC3 and HPI Nitro RS4 3. The parts are constructed of T6 and T7 hardened aluminum and have machined-in silver highlights for a totally custom look.

Various item nos. \$20 to \$100.



SCHUMACHER USA Sport Scale wheels

Put away your paintbrush; you can now get that painted-center look straight from the package with Schumacher's Sport Scale wheels. There are plenty of style and color options to choose from, so you can match the hoops to your bodywork.

Various item nos.
\$12.99/4 pack.



OFNA 8-port Hyper .21

The Hyper .21 puts out ample power in a bunch of OFNA RTRs, but the new 8-port model was designed to take the engine to the next level. It features more ports, more power and has all the usual Hyper features: bushed, machined con-rod, ABC construction and bump- or pull-starting. In addition to making the 8-port engine available for all after-market big-block applications, OFNA plans to include the mill with a new version of the Hyper 7 RTR.

Item no. 53212 \$160.



Campioni di Nitro

**Custom Blended To Rossi Specifications
Made In The USA
Distributed By Trinity**

Available in Quarts
20% Nitro (MH4120R)
30% Nitro (MH4130R)

High Power Nitro Team Racing Blend

www.teamtrinity.com

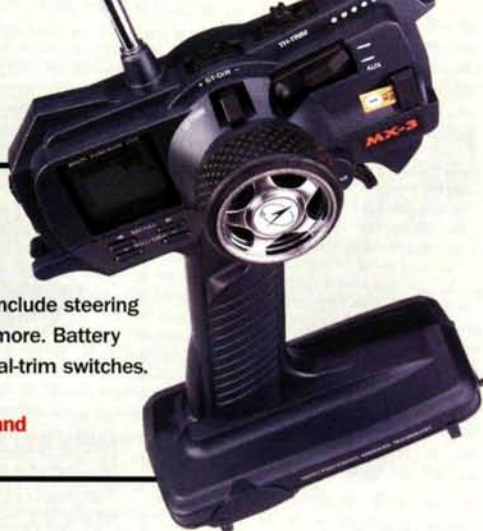


HOT PISTOLS

AIRTRONICS MX-3 ESC

The new MX-3 is now available! This 3-channel unit is perfect for the T-Maxx and other vehicles with "you-shift-it" transmissions, and the MX-3's menu-driven display makes it easy to navigate the many adjustable features that include steering and throttle endpoints, dual rate, subtrim, 5-model memory, servo rate and more. Battery voltage is graphically displayed, too, and adjustments are easy with the digital-trim switches. Airtronics offers the MX-3 with a variety of servo configurations.

Various item nos. depend on the servo(s) included (transmitter, receiver and 94102 standard servo); \$125.



FUTABA 3PK

Whoa; nice digital camera! Uh, actually, it's Futaba's new 3PK pro-radio. With its silver case, rear-facing LCD screen and lefty/righty adaptability, there's no mistaking the 3PK for any other transmitter; you can even convert it to a drop-wheel setup. Performance matters most, though, and according to Futaba, the 3PK responds nearly twice as fast to commands when used with a proprietary Futaba receiver (but the unit is still compatible with "standard" FM gear).

Various item nos. (75MHz or 27MHz with receiver) \$349; (PCM transmitter only) \$319.



JR RACING XR3i

JR's newest midline FM system backs up its unique looks with plenty of features, including dual-rate steering with a steering-override switch, 4-model memory, lap timer and 3-channel capability. Adjustable exponential is new to the XR3i and is featured on both the steering and throttle channels. The new radio is available in 27MHz and 75MHz versions and includes a metal-gear, 70 oz.-in. Z590M steering servo.

Item nos. JRP334275 (75MHz) \$169.99; JRP334227 (25MHz) \$169.99.



HITEC Aggressor

In addition to the usual servo-reverse and trim functions, Hitec's new Aggressor has dual-rate steering and a charging jack. If you move up to the FM model, you'll also get independent steering and throttle endpoints and a pushbutton third channel for transmission shifting or other servo-actuated functions. You can even change the Aggressor's look with different-color "palm pads" and "tuning covers." Hitec plans to offer the Aggressor in a variety of servo and ESC combos to suit all applications.

Various item nos. (AM) \$55; (FM) \$80.



JR RACING R-1 PRO

JR's feature-packed R-1 returns with a faster frame rate for an even greater response. According to JR, the new "FPPM" fast frame-rate modulation "gives the racer an almost telekinetic link with his car, truck, or boat." The steering wheel's spring has a progressive rate, so steering effort increases with wheel travel for better "feel." Sounds good, but we know you just want an R-1 Pro for the pimpin' gold trim on the wheel and switches.



Item nos. JRP3340X (FM 27MHz) \$339.99; JRP3340Y (FM 75MHz) \$339.99; JRP3360X (PCM 27MHz) \$379.99; JRP3360Y (PCM 75MHz) \$379.99.



DURATRAX Nitro Evader ST

This truck caught us by surprise! The Nitro Evader ST has an all-new, O.S.-built pull-start DTX .18 engine with a 2-needle carb and a ton of other features that include: a channeled, blue-anodized, aluminum chassis; an aluminum header and tuned pipe; threaded aluminum shocks; enclosed radio and battery compartments; a slipper clutch; steel turn-buckles; full bearings; and CV-type axles. Like other DuraTrax RTRs, the Nitro Evader includes a Futaba-built radio system and everything else you'll need to run the truck, minus fuel.

Item nos. DTXD62** (RTR) DTXD0062** (assembled without radio). Pricing not yet determined.



NOVAK GT7 ESC

There are lots of features in this sequel to the Novak Cyclone! You can set up the GT7 with your choice of seven factory-programmed profiles, or individually set standard brake, drag brake, minimum brake, drive frequency and minimum drive from the One Touch setup button—no external programmer required. The on/off switch and power capacitor can be mounted to the ESC case with clever snap-on brackets, and Radio Priority Circuitry and Polar Drive Technology are built in (as usual).

Item no. 1785; \$150.



HORIZON HOBBY Omega and OPS Engines

Horizon now offers two lines of Italian engines for you to choose from, with both sport and competition offerings. The Omega line includes the XT .12, Sport .21 and Super Comp .21; the OPS Engines' lineup includes the Pro .12, Pro .15 and Pro 7 .21.

All of them feature first-class construction and the legendary power that Italian engines are known for.

Various item nos.; Omega engines \$149 to 199; OPS engines \$109 to \$139.

BOLINK Micro Dragster

This is a prototype, but we're hopeful that Bolink will put the Micro Dragster into production; the fiberglass-chassis, foam-tire flyer looks like the quickest way to get down a hallway, and it's built like Bolink's "big" 1/10-scale rails.

Prototype; item no. and pricing not available.



NOVAK spy Lithium ion battery and spy motor for HPI Micro RS4

Novak packs big volts into a small package with these additions to the Spy line. The new-tech lithium-ion battery delivers 1100mAh and 7.8 volts for powerful acceleration and long run times. The required, special battery charger is included with the pack. The Spy micro-modified motor can handle up to 9 volts and complements the power pack with a fast (but not too fast) wind and factory-installed capacitors.

Item nos. 4405 (battery and charger) \$89; 5000 (battery only) \$39; 3090 (motor) \$29.



DYNAMITE Aluminum for Tamiya Terra Crusher

There are way too many item numbers to list, but as you can see, Dynamite can replace just about every part of your Terra Crusher with red-anodized aluminum parts.

Various item nos. \$20 to \$80.



NOVAK Switch Frequency synthesizer module for Airtronics M8

Novak's new Switch module for the Airtronics M8 can synthesize all 30 75MHz frequencies, thus making transmitter crystals obsolete. The FCC-approved, ROAR-legal unit is a direct replacement for the stock M8 module.

Item no. 2680 \$189.



TRAXXAS Nitro 4-TEC and Nitro Rustler TRX 2.5

Traxxas has updated the long-lived Nitro 4-TEC and Nitro Rustler with the all-new TRX 2.5 engine and EZ-Start 2 system, which gives both trucks a big performance boost!

According to Traxxas, the 4-TEC can now top 60mph straight from the box, and the Rustler is good for more than 45mph, with 50-plus easily available by gearing up.

Item nos. 4810 (Nitro 4-TEC with TRX 2.5) \$329; 4410 (Nitro Rustler with TRX 2.5) \$305.



KYOSHO Toyota and BMW Mini-Z F1s and option parts

Kyosho's newest winged wonders include the Williams BMW and the Panasonic Toyota. Kyosho also offers a bunch of upgrade parts to dial in your F1, including ball bearings, an X-Speed motor, ball diff, graphite rear-suspension plate, aluminum heat-sink motor mount and rear shock set. You can even add aluminum wheels in O.Z., BBS and Enkei styles and fit them with high-grip rubber.

Item nos. KY0D17 (Williams no. 5) KY0D18 (Williams no. 6) KY0D21 (Toyota no. 24) KY0D22 (Toyota no. 25) \$170/each. Various option-part item nos. \$7 to \$14.

And your wife says there's no passion left in you.



Radio Control Cars

O Scale Engines



SCHUMACHER Nitro Fusion Extreme

The Fusion brings big-block power to 1/10-scale touring, for a lopsided power-to-weight ratio that could make it the fastest sedan on the road. The RTR version is offered in BMW 328i, Subaru WRX and F-155 truck versions and includes a 3-speed transmission, hex-shaft starting, Airtronics Blazer radio gear and a glow-starter. The Fusion is geared for a top speed of about 60mph, but optional "speed gears" will be included that (according to Schumacher) will push its speed to 80mph.

Various item nos. (kit) \$349.99; (RTR) \$449.99.



SIDEWINDER Race and new Backyard Basher Fuels

Sidewinder Race fuel (for all-out competition) and Backyard Basher fuel (with extra engine-saving lubricant) are available in new containers. Both the quart and gallon containers are now a solid black color, which protects the fuel from the effects of direct UV rays.

Various item nos. \$6.99 to \$10./qt.; \$17.50 to \$23./gal.



MCD 1/5-scale 4WD TRUCK

Now this is a big truck! MCD's giant weighs in at more than 30 pounds and measures over 3 feet long with its polycarbonate, bathtub-size Dodge Ram body installed, and its chevron tires are wrapped around 8-inch wheels. A Zenoah G230 gas engine powers the colossus, and a 4-wheel independent suspension with aluminum shocks that are as big as rolls of quarters keeps this big rig rolling over rough stuff.

Item no. MCD1 \$1,749.

HO Train Sets



Slot Cars



Model Rockets



Model Airplanes



Monster Kits



Your hobby is our hobby too. For great finds on whatever you're into, check out eBay.com.
AOL Keyword: eBay





XTM RACING X-terminator

The give-'em-lots-of-features approach always works! XTM's big buggy is loaded, and it includes an XTM Racing .247 engine for super power. Easy-to-remove sealed diffs, a tuned exhaust, universal-joint drive shafts with silicone boots, a 3mm chassis, full bearings, a sealed radio box and a factory-finished body are all standard, along with Hitec radio gear and a heavy-duty steering servo.

Item no. 32329 \$450.



XRAY C-Hub suspension

Here's yet another way to dial in your XRAY! The new suspension replaces the standard pivot-ball setup and features high-quality CNC-machined parts and new molded arms. This suspension is slightly "softer" than the standard pivot ball suspension and fits both the Evo 2 and the original T1.

Item no. 30 0901 \$167.



PRO-LINE 40-series tires and wheels

Rollin' on 20s? Try 40s on for size. Pro-Line's new wheel concept is 1 inch wider and taller than a standard Maxx rim. When combined with the matching 40-Series tires, you'll have a Maxx-width contact patch and tread diameter without the flex, overhanging sidewalls of a standard Maxx-style tire. The new hoops are available in two styles, Outback and Velocity 6; matching tires in Pro-Line's soft M2 compound can be had in "Road Rage" and "Big Joe" styles.

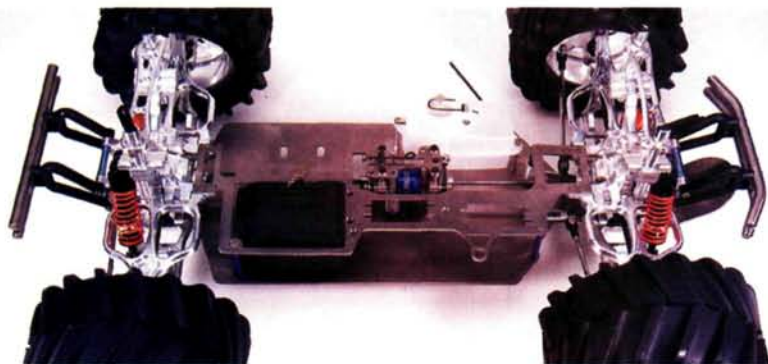
Item nos. 104-00 (Road Rage tires) \$29/set of 4; 1103-00 (Big Joe tires) \$33/set of 4; 2665-01 (Outback wheels) \$22/set of 4; 2664-01 (Velocity 6 wheels) \$22/set of 4.



PARMA MAXX FIRE TRUCK BODY

Parma's latest body brings classic water-squirter looks to Maxx trucks and most other monsters, and an extensive decal sheet is included to make finishing easy. Get a can of red paint while you're at the shop.

Item no. 10116 \$26.99.



HARDCORE RACING COMPONENTS 21 MUTANT MAXX conversion kit

Check out this month's "4x4" column for a full report on Hardcore's amazing T-Maxx conversion kit, which adds titanium toughness and an 1/8-scale, buggy-type drive train (complete with a center diff) to the Traxxas T-Maxx for super durability and handling.

Item no. HCR-0361 \$239.





SERPENT 705

The Serpent 705 is the latest version of the national champion Impulse Pro. A carbon-fiber radio plate, 7075-T6 chassis plate, under-tank battery location, lightened 2-speed transmission, Centax II clutch, top-mounted 1.5mm rear anti-roll bar, carbon shock towers and 4-step adjustable shocks with a new key-type shock-rod system are just a few of the kit's new features.

Item no. SER 801040 (kit only, no engine) \$379.95.



TEAM LOSI Triple-XS Graphite Plus

In addition to the RTR Sport version, Team Losi has added an all-the-hop-ups version of the Triple-XS to its touring car line. The kit-only supercar includes all of Losi's optional graphite and carbon-fiber chassis and suspension parts, aluminum MIP CVDs, titanium turnbuckles, threaded shocks, hard-anodized-aluminum suspension balls, revised rear suspension arms and shock tower, ball-bearing steering, an extra-efficient drive belt and more—as well as Losi's new Alfa 156 body, and all this for a much lower price than if the kit and upgrades were purchased separately.

Item no. LOSA0251 \$269.99.

BRUSHLESS gets real!



Ever since Novak dropped the brushless bombshell back in 2000, we've been waiting for brushless motors to enter the mainstream. It looks as if 2003 could be the year now that Novak has its system up and running (we drove it; it works), joining Team Orion's Vortex and the established Hacker series as the big brushless brands in the car market. All tout the same advantages: more power, longer run times and virtually no maintenance.

TEAM ORION Vortex

Orion's Vortex system is available in three versions: Vortex 8, Vortex 10 and Vortex 12. The names correspond to each Vortex's approximate power equivalent in a brushed motor; for example, the Vortex 10 performs like a 10-turn modified brush motor. The Vortex speed control is sold separately, can be used with both sensored and sensorless motors, features reverse with disable capability and can handle 6 to 12 cells.

Item nos. 28000 (Vortex 8) 28001 (Vortex 10) 28002 (Vortex 12) \$105/each; 63000 (Vortex Controller) \$250.



NOVAK super sport

The Super Sport setup includes a mild-modified, sensor-controlled, ball-bearing motor and programmable speed control. The motor is completely sealed, fits all RC cars designed for standard-size brushed motors, and the system is factory-wired and ready to install.

Item no. 3005 \$395.



HACKER

Hacker has aimed its latest motor at monster truck fans. The heat-dissipating, finned can helps the single motor do the job of two brushed motors, and it can handle up to 12 cells. A speed controller isn't included; Hacker offers the Master Sport controller to complete its brushless motor system.

Item nos. C50-12T (motor) \$219; (controller) \$199.



PRO-LINE Prototype dominator suspension

Look closely; it's an OFNA Dominator chassis, but the suspension arms are from Pro-Line's T-Maxx suspension-upgrade kit. A set of custom aluminum bulkheads makes the conversion possible. Want your own? Too bad—they're custom one-offs. Start bugging Pro-Line.

Custom parts; item no. and pricing not available.



TAMIYA Raybrig NSX

Tamiya's newest re-skin of the tub-chassis, dual-belt TA-04R is what you see here. The hot NSX body includes a fully licensed Raybrig decal set, and a complete interior is also part of the package!

Item no. 58297
\$400.



KYOSHO TR-15 Rally car

Remember Kyosho's Inferno TR-15 4WD buggy? It has been re-skinned as a rally car, and given our experience with the buggy, the Rally should be an exciting dual-purpose performer! Wishbone suspension, a sealed

radio compartment, full-time 4WD and GS15R pull-start power will be standard equipment. Looks hot!

Too new for item no.; \$270 (estimated).



PRO-LINE MAXX performance bumpers and steering kit

Pro-Line's new Maxx Performance bumpers have a durable, metallic, polymer coating that resists chipping, and the new steering kit is claimed to be 40 percent stronger than the stock parts. The kit moves your T-Maxx's servo-saver to the steering bellcranks, adds four ball bearings for smooth steering action and blue anodized hardware for good looks.

Item nos. 6018 (bumpers) \$14; 6019-00 (steering kit) \$48.



MRC/ACADEMY RT-4 GP

MRC is back in the nitro off-road game with the Academy RT-4, a 4WD stadium-style machine that features shaft drive, a 3mm aluminum chassis, sealed radio box, a slide-carb .15 engine and lots of purple!

Item no. and pricing not yet determined.



XTM RACING Monster engines

XTM has really big engines in both the small- and big-block engine segments. The Outlaw .18 is one of the largest small-block engines, and the .247 is one of the biggest big-blocks. According to XTM, the monster engines are designed for larger displacements right from the start; they aren't bored-out versions of smaller engines. This results in a better overall design that produces excellent power across a broader powerband, says XTM.

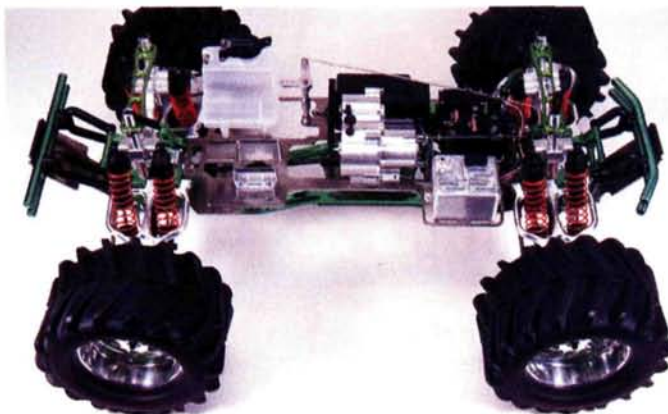
Various item nos. depending on shaft and starter configuration.
(.18) \$99 to \$109; (.247) \$140 to \$247.



TEAM ORION Fresh Kicks Tires

Orion's new rubber line includes a bunch of tread patterns for monster trucks and standard 2.2-inch wheels. The Maxx-sized tires can be purchased factory-glued to Revolver wheels (with standard or 1/2-inch offset), or unmounted with foam inserts to fit the Maxx-size wheel of your choice. All Fresh Kicks tires are available in "Medium" compound or extra-soft "Pro."

Various item nos. \$20 to \$30/pair.



HARDCORE RACING COMPONENTS T-Maxx Pro chassis

Hardcore's heavily relieved titanium Pro chassis trims an ounce and gives your T-Maxx a unique look.

Item no. HCR-0370 (chassis plate only) \$115.



TAMIYA XB Integra Type R

The Acura shell captures the extra flares, scoops and wing of the Mugen-tuned full-scale ride, and Tamiya's new XB (eXpert Built) offerings ride on the new TT01 chassis. The TT01 will be the platform for future XB sedans and looks similar to the TB-01 with its longitudinally mounted battery, tub chassis and shaft drive, but the suspension has been revamped with new arms, hubs and plastic drive shafts. Tamiya's combined CPR receiver/ESC unit is included along with a new Tamiya radio system.

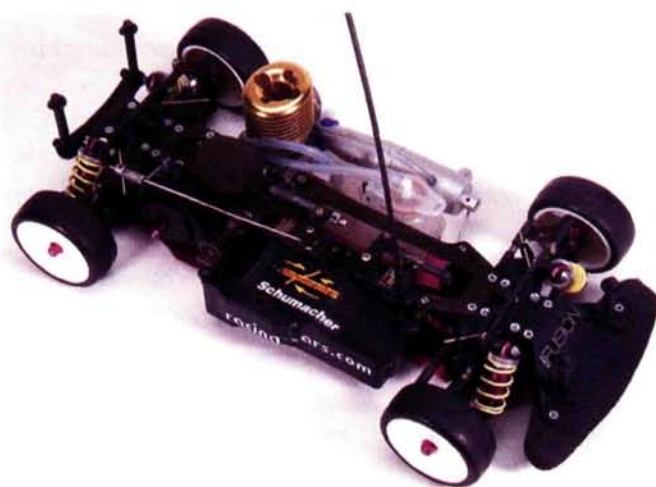
Item nos. 57715 (white) 57716 (blue) \$252.



TRINITY/ROSSI Team Blend Fuel

Rossi Italy has licensed Trinity to blend and offer this fuel mixture in the USA for use in all nitro engines, especially those made by Rossi (of course). This is the same fuel mixture as that used by the Italian Rossi racing team, and it has been blended for maximum power and engine life.

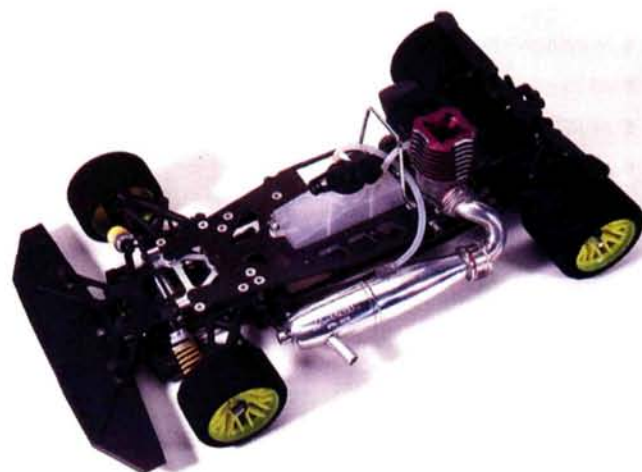
Item nos. MH4120R (20-percent nitro) \$12.99/qt.; MH4130R (30-percent nitro) \$13.99/qt.



SCHUMACHER Fusion R12 Prototype

The Schumacher guys say this proto car bears little resemblance to what the final R12 design will become, but its 2-belt drive system is well sorted out, and Schumacher expects the RTR to be a force in nitro touring. Look for more information as Schumacher gets closer to a production car.

Prototype; item no. and pricing not available.



SERPENT 950

The 950 is Serpent's all-new entry into the highly competitive 1/8-scale arena. Simpler than last year's Veteg, the new car features: adjustable roll centers; under-tank battery mount; single-pivot steering with an adjustable servo-saver; ultralight 2-speed and Centax II clutch; 4-step adjustable shocks with a new key-type shock-rod system; strengthened 3.5mm rear pivot pins ... plus much more than we can list here. Look for a review in *RC Nitro*!

Item no. SER 902000 (kit only, no engine) \$650.



FUTABA Delphi Indy Car

Futaba's completely ready-to-run micro open-wheeler features no-peel printed graphics for lasting good looks. Rubber tires, kingpin front suspension and a flexible rear pod with an integrated motor mount and differential help its handling. A Futaba radio is included (of course).

Item no. FUTD10 \$100.



TAMIYA Vodafone AMG Mercedes TL-01

The long-lived TL-01 shaft-drive chassis gets a new look with this AMG Mercedes shell, which features the usual Tamiya detail. All the racing livery is supplied, and the rugged monocoque chassis is easy to assemble. A mechanical speed control and 540 motor are included along with new, longer suspension arms for better handling.

Item no. 58296 \$163.



THUNDER TIGER EK4 S2 Unlimited Truck

It looks as if Thunder Tiger's all-the-trick-stuff version of the mega-power EK4 monster truck is ready to hit the shops! The ground shaker requires a 2-channel radio, high-torque servos and your favorite

fuel. Look for the standard EK4's .70 engine to be replaced by a (gasp) .90 mill for the Unlimited truck.

No item no. and price information; the Unlimited is due in April 2003!



XXX-MAIN decals

New additions to XXX-Main's long line of decals include Pro Flames, Eagles and your mom's favorite: Chicks Rule. The full-color decals are fuelproof, so you can stick 'em on your nitro ride.

Item nos. S009 (Pro Flames), S010 (Eagles), S011 (Chicks Rule) \$4.99/each.

SOURCES

Airtronics (714) 978-1895; airtronics.net.

Bolink R/C Cars Inc. (770) 963-0252; bolink.com.

Competition Electronics (815) 874-8001; competitionelectronics.com.

Corally USA; distributed by Specialized RC Intl. (407) 681-5905; corallyusa.com.

DuraTrax; distributed by Great Planes; duratrax.com.

Dynamite; distributed by Horizon Hobby.

Fantom Racing (616) 649-9583; fantom-motors.com.

Futaba; distributed exclusively by Hobbico/Great Planes; futaba-rc.com.

GoldScallop Intl. (416) 609-2468; goldscallop.com.

Great Planes Model Distributors (800) 637-7660; greatplanes.com.

Hacker; distributed by Leisure Electronics (949) 586-0955; leisureelectronics.com.

Hardcore Racing Components (661) 294-5032; racinghardcore.com.

Hitec RCD Inc. (858) 748-6948; hitecrd.com.

Horizon Hobby Inc. (800) 338-4639; horizonhobby.com.

Hot Bodies (909) 296-9340 hotbodiesonline.net.

HPI Racing (949) 753-1099; hpiracing.com.

JR Racing; distributed by Horizon Hobby.

Kyosho; distributed by Great Planes; kyosho.com.

LRP Electronics; distributed by Team Associated.

MCD; distributed by Brooklyn Hobbies (718) 951-2500; brooklynhobbies.com.

MDP; distributed by OFNA Racing.

Megatech Intl. (201) 662-8500; megatech.com.

Model Rectifier Corp. (MRC) (732) 225-2100; modelrec.com.

New Era Models (603) 888-4453; neweramodels.com.

Novak Electronics Inc. (949) 833-8873; teamnovak.com.

OFNA Racing (949) 586-2910; ofna.com.

Parma/PSE (440) 237-8650; parmapse.com.

Pro-Line (909) 849-9781; pro-lineracing.com.

Schumacher USA (813) 889-9691; racing-cars.com.

Serpent Inc. USA (305) 639-9665; serpent.com.

Sidewinder Fuels; distributed by Morgan Fuel (800) 633-7556; morganfuel.com.

Tamiya America Inc. (800) 826-4922; tamiyausa.com.

Team Associated (714) 850-9342; teamassociated.com; rc10.com.

Team Losi; distributed by Horizon Hobby; teamlosi.com.

Team Orion Inc. (714) 694-2812; team-orion.com.

Thunder Tiger/Ace Hobby Distributors (949) 833-0088; thundertiger.com.

Трахас Corp. (888) 872-9972; трахас.com.

Trinity Products Inc. (732) 635-1600; teamtrinity.com.

Venom Racing (800) 705-0620; venom-racing.com.

HRAY; distributed by Serpent Inc. USA; teamhrray.com.

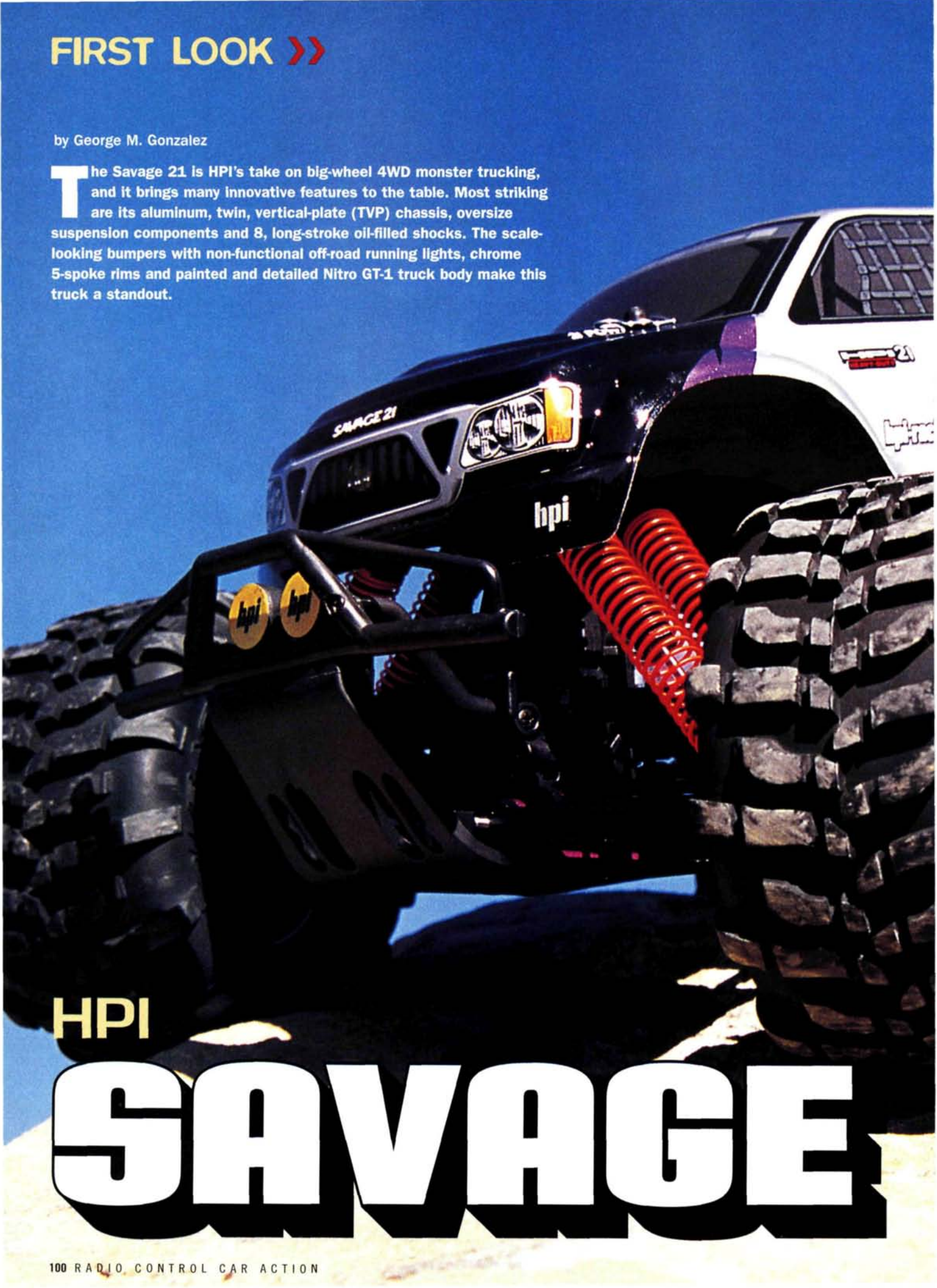
HTM Racing; distributed by Global Hobby Distributors (714) 964-0827; globalhobby.com.

XXX-Main (877) 744-6793; xxxmain.com.

FIRST LOOK >>

by George M. Gonzalez

The Savage 21 is HPI's take on big-wheel 4WD monster trucking, and it brings many innovative features to the table. Most striking are its aluminum, twin, vertical-plate (TVP) chassis, oversize suspension components and 8, long-stroke oil-filled shocks. The scale-looking bumpers with non-functional off-road running lights, chrome 5-spoke rims and painted and detailed Nitro GT-1 truck body make this truck a standout.



HPI

SAVAGE

SPECS

PRICE

Est. street price \$450

DIMENSIONS & WEIGHT

Length overall 21 in. (533mm)

Width 16.79 in. (426mm)

Height to top of cab 10 in. (254mm)

Wheelbase 13.25 in. (336mm)

Tire dimensions (WxH) 6.25x3.25 in.
(158x81mm)

CHASSIS

Type Twin vertical plate (TVP)

Material 6061 aluminum

DRIVE TRAIN

Drive axles Steel dogbones

Slipper clutch Disc type

Transmission Sealed, 2-speed, auto shifting

Bearing type Rubber-sealed bearings

SUSPENSION

Type Double-wishbone

Shocks 8 long-stroke, oil-filled

ENGINE & ACCESSORIES

Engine HPI Nitro Star .21 BB rear-exhaust

Starter Pull-start

Air filter Dual-element

Manifold Aluminum

Exhaust Dual-chamber composite tuned pipe

Fuel tank 160cc with primer

INCLUDED ELECTRONICS

Radio HPI TF-4 3-channel radio system

Steering servo High-torque HPI SF-2

Throttle servo HPI SF-1

HPI Nitro Star 21 BB

The Savage 21 shouldn't have any shortage of go-power thanks to its included HPI Nitro Star 21 BB rear-exhaust pull-start engine. The tall, purple-anodized heat-sink head looks great and should keep engine running temperatures in check. Other features include a dual-needle 7mm slide carb, an ABC piston and sleeve and a rugged pull-start mechanism. An aluminum manifold and composite, dual-chamber tuned pipe and rugged, cast-aluminum engine mount are also standard.



21



<< Low-CG design

The TVP chassis gives the Savage 21 a sleek, all-business stance. The transmission, engine and radio tray are mounted low on the chassis to lower the truck's CG (center of gravity) and improve handling. HPI is known for its awesome-looking hoops, and the Savage 21's chromed, 5-spoke rims are no exception. The treaded tires look as if they'll hook up well on just about any surface. The fuel tank kind of hangs out in the breeze on the left side of the chassis. I'll reserve judgment on the fuel tank's durability until we get our hands on a production sample.

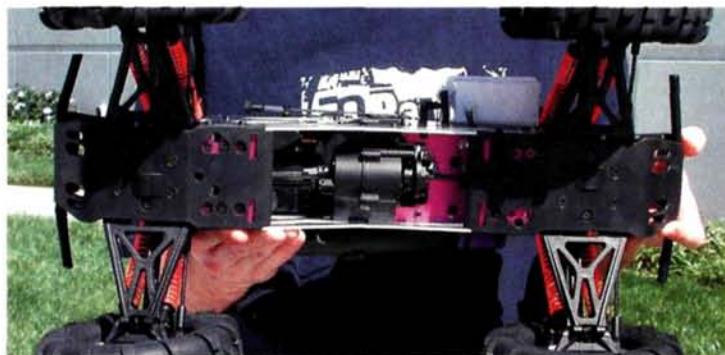
HPI SAVAGE 21



<< Track-specific radio gear

The Savage 21 is equipped with an HPI SF-2 high-torque servo to better turn the truck's huge, treaded tires. The steering and throttle/brake servos, receiver and included 4-cell battery holder are installed in a compact radio box. A molded cover (not shown) protects the electronics. The HPI RF-2 AM 27MHz 4-channel receiver is a tantalizing mystery,

considering that the included TF-4 transmitter has 3 channels. The truck requires only 2 channels to operate, but the radio system is ready for the optional reverse module.



> Tough shaft drive

Thick steel dogbones reach from the centrally mounted tranny to the front and rear gear differentials, which are installed on aluminum sub-plates. Central universal drive shafts will surely be factory options, but the stock units look as if they'll last a long time. The molded skidplates protect the front and rear sub-assemblies and suspension-arm mounts. The truck's wide stance should mean stable running.



<< Big truck ... big fuel tank

To extend the time between fill-ups, HPI wisely spec'd a large-capacity 160cc fuel tank. It has a built-in primer, a spillway with a runoff and a cap-mounted pressure-line pick-up. To facilitate maintenance, the tank is mounted on the chassis' left side and is held with body clips that can easily be removed. The fuel line's anthracite-gray color adds to the truck's classy looks.

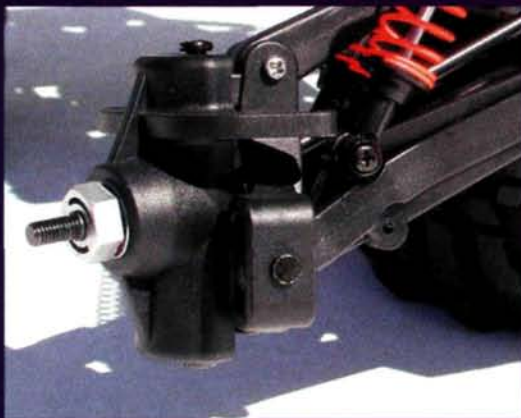
Drive-train protection >>

The Savage 21's low internal gearing allows the use of a small spur gear. A heavy-duty slipper clutch is required to protect the drive train from the torque of the big-block engine and the shock associated with landing off jumps under power. The Savage 21's adjustable, single-pad slipper clutch looks as if it's up to the task.



TVS chassis

The Savage 21's engine, transmission and radio box are mounted between two, vertical, 2.5mm-thick, 6061 aluminum chassis plates. The chassis has realistic monster looks, but more important is that it's a strong platform that's needed to harness the power of the HPI Nitro Start .21 BB engine. Check out the intricate throttle and brake linkages. A bellcrank is needed to open and close the slide carb, and the brake lever is on the side of the chassis.



Extra beef

The strong lower suspension arms are nearly twice as thick as typical 1/10-scale suspension arms. Although they aren't clearly visible, the stainless-steel suspension pins are also extra beefy. A narrow upper suspension arm pivots between a pair of extra-extra-long composite-body shocks (clearly the longest shocks we've ever seen on an 1/8-scale monster truck). The Savage 21's suspension is a unique, rugged-looking caster-block/steering-knuckle system. Camber is fixed on all corners, but an adjustable upper-arm system might be available as an option in the near future. Thick steel dogbones transfer power to the wheels.

Let's get ready to rumble

The Savage 21 arrives fully assembled right down to the glued-on tires and painted and trimmed body. HPI claims that anyone could have the truck up and running in less than 15 minutes. A complete instruction manual that covers assembly will help when you're doing the usual maintenance.

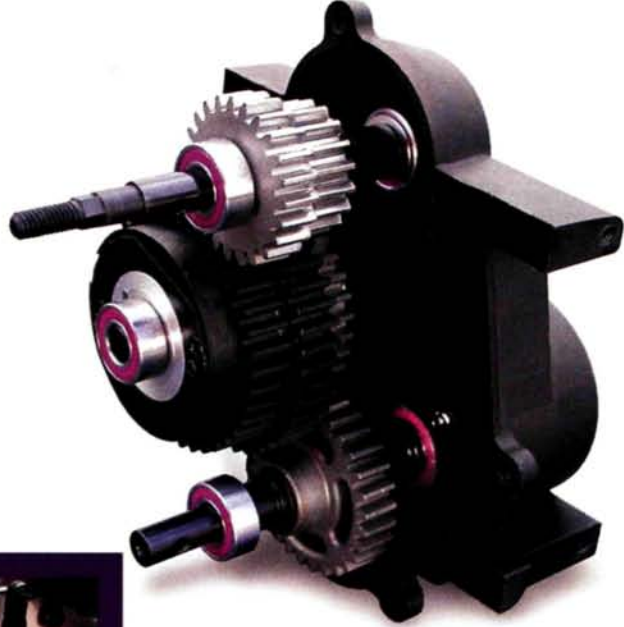
The new GT-1 truck body is mounted low on the chassis, so the Savage 21 looks more like a desert racer than a stadium crusher. The body features a good-looking silver, purple and black paint scheme with cool-looking graphics and factory-applied decals.

Built by Futaba for HPI, a TF-4 3-channel, narrow-band AM radio system is included. An HPI SF-2 high-torque steering servo helps point the big wheels where you want them to go. The transmitter features the usual steering and throttle trims and servo-reversing switches as well as a thumb-activated third-channel switch and a steering dual-rate adjustment knob. The third channel is for hooking up the optional reverse module that provides reverse without your having to install a third servo.



Laydown suspension >>

The long-travel shocks lean inward to reduce roll in the corners, and clip-on preload spacers allow ride-height adjustment. Apparently, HPI has worked out the suspension geometry because only one shock mount is provided on the suspension arms and shock towers. The adjustable body posts are designed to accommodate a variety of body styles. Extra-long rear body mounts are included for SUV-style bodies. Threaded rods allow rear toe-in adjustment.



Heavy-metal tranny

The auto-shifting 2-speed tranny features metal gears, which are an expensive option on some other trucks. Rubber-sealed bearings and a heavy-duty 2-speed clutch mechanism are also standard. An optional reverse module will be available. An access hole in the tranny case allows you to slide in a 2mm Allen wrench to make shift-point adjustments.

Crash protection

The scale-looking tube bumper and bumper mounts look tough. Check out the off-road running lights with HPI lens caps; they don't actually work, but they look pretty cool. The molded skidplate seems to be very rugged. Check out the captured aluminum suspension-pin braces; this is a critical stress area on the big-wheel monster trucks, so HPI wisely spec'd aluminum suspension-pin braces.



SOURCE GUIDE

HPI RACING (949) 753-1099; hpiracing.com.

FIRST LOOK >>

by George M. Gonzalez

MONSTER TRUCKS ARE HERE TO STAY. The Kyosho Mad Force, Tamiya Terra Crusher, OFNA Titan and Traxxas TRX 2.5-powered T-Maxx were the first out of the gate, and now Team Associated kicks it up a notch with its Monster GT—code name “BFT” (bigger, faster, tougher).

It's Team Associated's first 4WD nitro monster truck, and there's no doubt that the company's design team studied the latest trends because the truck appears to have all of the fea-

tures enthusiasts want: big-block, .21 performance; 2-speed transmission with reverse; an adjustable, wide-track suspension for stadium-truck-like handling; heavy-duty chassis and suspension components; a large-capacity fuel tank; high ground clearance and tons of suspension travel. The Monster GT has all this and much more.

team associated

MONSTER

SPECS

PRICE

Est. street price \$499

DIMENSIONS & WEIGHT

Length overall 22 in. (558mm)

Width 17.25 in. (438mm)

Height to top of cab 10.75 in. (273mm)

Wheelbase 14.5 in. (368mm)

Tire dimensions (WxH) 3.5x5.75 (146x89mm)

Weight (RTR) 12 lb. (5,443g)

CHASSIS

Type Extruded-aluminum channel

Material Aircraft aluminum

DRIVE TRAIN

Drive axles Universal-joint drive shafts

Slipper clutch Single Rulon disc

Transmission Sealed 2-speed auto shifting with reverse

Bearing type Shielded ball bearings

SUSPENSION

Type Upper and lower A-arms

Shocks 8 composite-plastic-body, oil-filled shocks

ENGINE & ACCESSORIES

Engine Associated .21

Starter Pull-start/hex-shaft start

Air filter 2-stage foam

Manifold Aluminum

Exhaust Dual-outlet composite-plastic muffler

Fuel tank Large-capacity with dual fuel pick-ups

INCLUDED ELECTRONICS

Radio Ace Jaguar 3-channel

Steering servo Ace 51807 metal gear

Throttle and shift servos Ace 51903

Associated big-block

The Monster GT will have plenty of scoot, thanks to its included big-block .21 engine. The Thunder Tiger mill features ABC construction for long piston and sleeve life, a tall 10-fin heat-sink head to keep it running cool, a 2-needle slide carb for tuning versatility and an SG-style crankshaft. An aluminum exhaust manifold and a tuned muffler with dual exhaust tips that exit underneath the rear suspension arms are also included.

The engine's most unusual feature is the pull-start mechanism that allows you to start it by tugging on the pull-start rope or by cranking the engine over with a power drill. A hex key (included) that you chuck onto a power drill mates with the hex-shaped hub in the center of the pull-start housing. Squeeze the trigger, and the engine fires up.

GT





Mondo ground clearance >>

The Monster GT has more than 5 inches of ground clearance, thanks to its scale-looking monster-truck chassis and enormous truck tires. The truck should easily be able to scale giant rocks and climb steep hills. The best part is that the suspension operates without a hint of bump-steer. We like the functional roll bar that reaches to the top of the body's roof—when the body is on, of course. Associated hasn't decided whether to equip the truck with chrome or satin-finish wheels.

Team Associated **MONSTER GT**



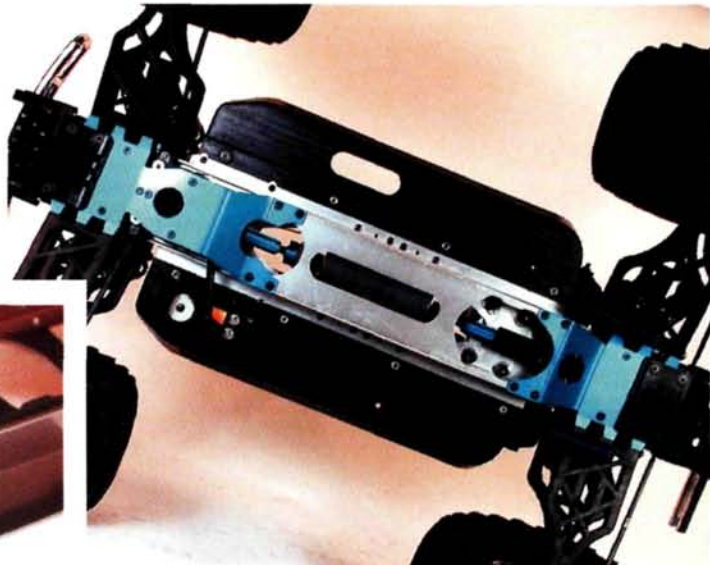
<< Sealed for protection

The receiver and onboard battery pack are in separate molded boxes with lids secured by body clips for easy access. The RTR production truck will most likely include a 4-cell battery holder (for reasons of economy), but a 5-cell, 6V hump pack fits nicely, as you can see.



>> Extruded-aluminum one-piece chassis

The extra-long, channelled chassis looks as if it's made of three or more pieces, but it's a solid piece of machined extruded aluminum. It extends the full length of the vehicle to form an extremely strong, rigid backbone. A lightweight Factory Team blue-anodized aluminum chassis will be available as an option.



>> Bulletproof undercarriage

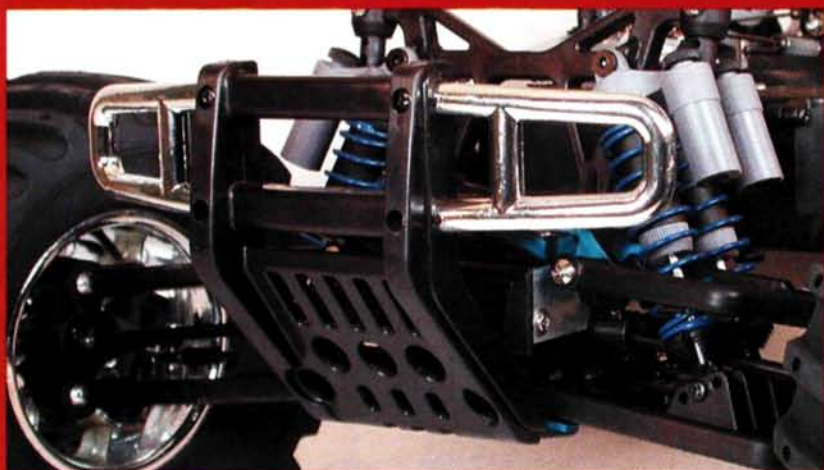
Molded side plates are attached to the chassis to form a tub. The slot in the left side plate is an exhaust outlet for an optional in-line-mounted tuned pipe. A blue-anodized aluminum Factory Team dual-chamber tuned pipe will soon be available.

Check out the aluminum roller shafts that reach out to the front and rear diff cases and the aluminum skidplates—stock equipment; front and rear universal swing shafts will be standard issue as well. If you look closely, you'll see the rubber exhaust tips that exit under the rear suspension arms.

Symmetrical parts >>

To reduce the Monster GT's parts count, the front and rear suspension arms, pivot-ball carriers, shock tower and shocks are identical.

The front and rear body posts and mounts may be adjusted to accommodate many of the available monster-truck bodies.



<< Quad shock suspension

The plastic-body, oil-filled shocks have decorative reservoirs for extra style. The reservoirs aren't functional, but the shocks are silky smooth nevertheless. Functional, aluminum-body reservoir shocks will soon be available. The shocks pass through the upper suspension arms as they do on the T-Maxx, but that's where the similarities end. The super-long suspension arms give the truck a wide-track stance for superior handling, and they pivot on aluminum mounts for extra security.

The shock tower and suspension arms have several shock-mounting positions to broaden tuning capabilities. Note how the chrome bumper is captured by the bumper mounts; looks tough!

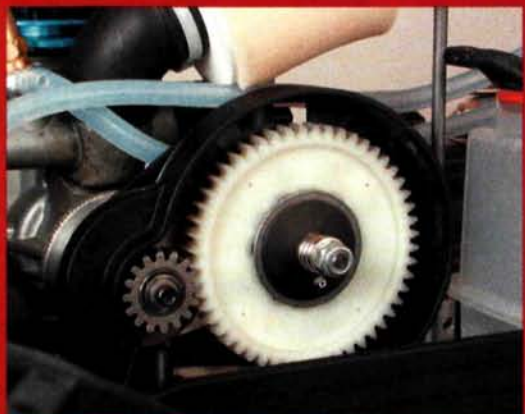
<< 3-channel operation

The Monster GT will be equipped with an Ace 51807 high-torque, metal-gear steering servo to help swing those tall monster truck wheels with authority. Two standard Ace 51903 servos control the throttle and

brake and reverse-shift functions. The large fuel tank features a dual fuel-pick-up system and will allow more than 8 minutes of running. Separate fuel pick-ups—one on the bottom of the fuel tank and one on the top—allow the engine to run even when the truck is on its lid (no more running down off the drivers' stand to turn-marshal your truck before the engine stalls!).

<< Pivot-ball suspension

Subtle camber and track-width adjustment are made by adjusting the depth of the pivot balls: T-Maxx-size hubs to allow wheels designed for the T-Maxx to fit on the Monster GT and vice versa.



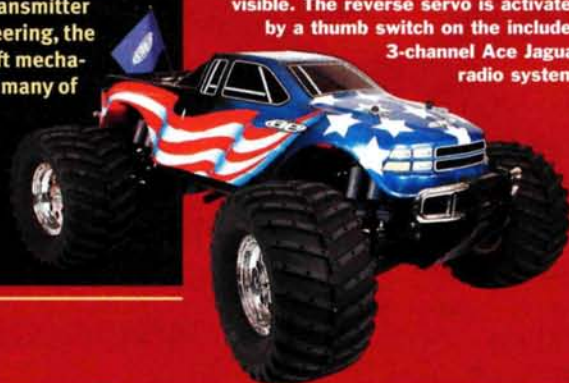
>> Transverse-mounted engine

The Monster GT departs from the norm with its transverse-mounted engine; most shaft-drive 4WD monster trucks have in-line-mounted engines. A bevel gear attached to the end of the spur-gear shaft mates with a bevel gear inside the transmission, and that's how the tranny gets its spin. The spur gear has a single-disc slipper clutch to protect the drive train and provide traction control. Note the molded shroud around the clutch bell and spur gear.



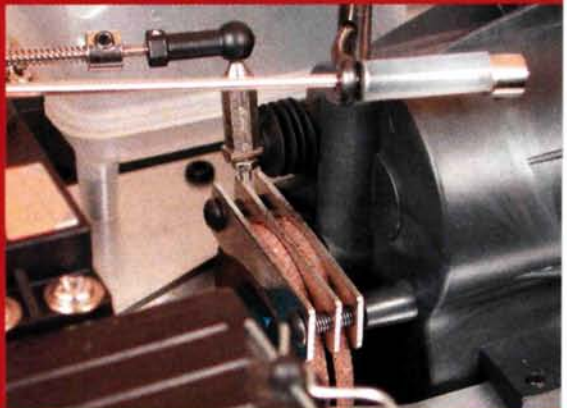
Ready to rock

The Monster GT will arrive 100 percent assembled right down to the screen-painted and trimmed body and bonded tires. The final details of the paint schemes that will be available haven't been worked out at this point, but the first 100 trucks to leave the assembly line will feature patriotic red, white and blue flag graphics that are similar to those on the truck featured here. The truck will include an Ace Jaguar 3-channel transmitter and three servos to operate the steering, the throttle/brake and the reverse shift mechanism. The truck is likely to include many of the "Plus" features included with the RC10GT RTR Plus—a fuel bottle, a glow-plug igniter with a charger and various tools, etc.—but these details have yet to be finalized.



Monster stopping power >>

The Monster GT is a big truck, and big trucks need right-now stopping power. It looks as if the dual-disc brake system will be able to bring the truck to a halt in a hurry. Three metal calipers actuated by a typical brake cam system put the pinch on the fiber rotors. The reverse linkage and shift lever are also visible. The reverse servo is activated by a thumb switch on the included 3-channel Ace Jaguar radio system.

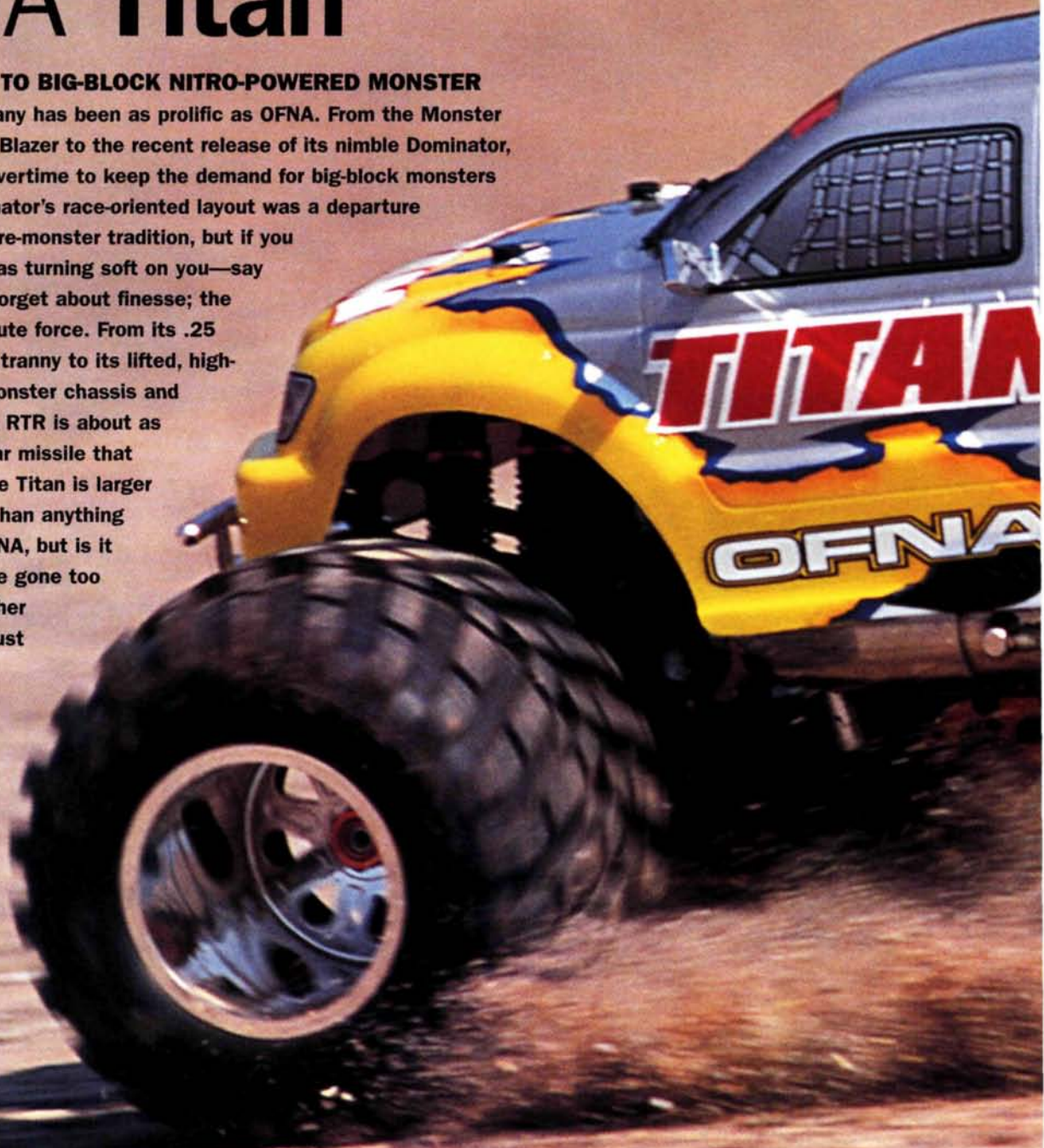


SOURCE GUIDE

TEAM ASSOCIATED (714) 850-9342; teamassociated.com.

OFNA Titan

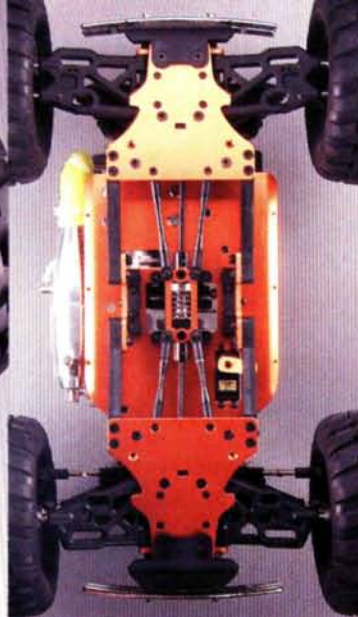
WHEN IT COMES TO BIG-BLOCK NITRO-POWERED MONSTER TRUCKS, no company has been as prolific as OFNA. From the Monster Pirate and Monster Blazer to the recent release of its nimble Dominator, OFNA has worked overtime to keep the demand for big-block monsters supplied. The Dominator's race-oriented layout was a departure from OFNA's large-tire-monster tradition, but if you feared that OFNA was turning soft on you—say hello to the Titan. Forget about finesse; the Titan is all about brute force. From its .25 engine and 2-speed tranny to its lifted, high-ground-clearance monster chassis and enormous tires, this RTR is about as subtle as the nuclear missile that shares its name. The Titan is larger and more powerful than anything we've seen from OFNA, but is it possible that they've gone too big? Let's see whether bigger is better or just ... bigger.



ORANGE
CRUSH



PHOTOS BY WALTER SIDAS



The Titan's two-tier design is heavily braced and seems rugged enough to handle just about anything.



Left: there's plenty of ground clearance for tackling the worst terrain. The Titan has adjustable upper-camber links and strong rear dogbones. Right: the Titan's dual A-arm/pivot-ball suspension provides plenty of adjustability. Threaded-shock preload, turnbuckle toe links and universal front axles highlight the Titan's features.



DATA CENTER

VEHICLE TYPE Nitro-powered monster truck
BEST BUYER Off-road monster truck fanatics
KIT RATINGS (poor, satisfactory, good, very good, excellent)
Instructions Not supplied at time of publication
Parts fit and finish Very good
Durability Very good
Overall performance Very good

SPECIFICATIONS

MANUFACTURER OFNA
MODEL Titan
SCALE 1/8
PRICE \$650
 (varies with dealer)

DIMENSIONS
Wheelbase 13 in. (330mm)
Width 17.25 in. (438mm)

WEIGHT
Total, as tested 208 oz. (5,897g)

CHASSIS
Type Stamped plate
Material 3.2mm anodized aluminum

DRIVE TRAIN
Type Shaft
Primary Clutch bell 11/15; spur gear 49/45
Transmission ratio (1st/2nd) 6.04:1/4.07:1
Final drive ratio (1st/2nd) 20:1/13.47:1
Drive shafts (F/R) OFNA CVA/dogbone
Differentials Sealed bevel gear with steel ring and pinion
Bearing type Metal shielded

SUSPENSION
Type (F/R) Upper and lower A-arm w/pivot ball/lower A-arm w/adjustable camber link
Shocks Aluminum-body with threaded preload

WHEELS
Type Chromed, one-piece plastic

TIRES
Type Split chevron pattern, 4.5x5.75 in. (114x146mm)

ENGINE AND ACCESSORIES
Engine Force .25
Carburetor Dual-needle, slide barrel
Exhaust Aluminum round-port manifold with aluminum tuned pipe
Fuel tank 125cc primerless w/internal fuel filter

THE TITAN ISN'T JUST A CONVERTED 1/8-SCALE BUGGY WEARING BIG TIRES.

KIT FEATURES

CHASSIS. The Titan isn't just a converted 1/8-scale buggy wearing big tires. Unlike the "truggies" we've seen previously, the Titan's chassis has a lifted center span for a T-Maxx-like profile, but the way OFNA raised the chassis is unique. The Titan chassis has three basic parts: a main chassis plate that holds the fuel tank, engine and electronics, and front and rear sub-plates that hold the diffs beneath the main chassis. An array of steel, plastic and aluminum brackets and braces ties the sections together. The upper plate is stamped from 3.2mm anodized aluminum with radiused sides for added rigidity. The thick orange plate is roomy compared with buggy-conversion trucks; there's plenty of space for the large fuel tank, enclosed radio box and .25-size engine. Steel braces tie the center spur housing to the front and rear shock towers to help stiffen the chassis against flex. The underside fasteners are hardened, countersunk Phillips-head screws. Beneath the chassis, a pair of aluminum vertical supports attached longitudinally in the center serves as mounting points for the Titan's four separate ladder braces. The braces support the lower aluminum plates that in turn support the diff housings and protect the underslung, high-torque steering servo. For added strength, OFNA further reinforces the diff plates with four metal braces that are attached to the underside of the spur housing.

DRIVE TRAIN. How do you take the .25's power and make it spin those big tires without blowing something up in between? OFNA chose a 2-speed tranny up top, with helical gears to get the spin downstairs and large dogbones that stretch out to the buggy-type front and rear diffs. CVA axles take the power out to the wheels. A dual-gear clutch bell turns the center-mounted 2-speed spur. Although the spur gears are molded, they're as wide as those on my 1/5-scale car. At the end of the spur shaft is a helical-cut steel gear that transmits power to a second helical gear. The second gear's shaft has outdrives on either end and is equipped with a heavy-duty slipper clutch to prevent any driveline stress from toasting the gears

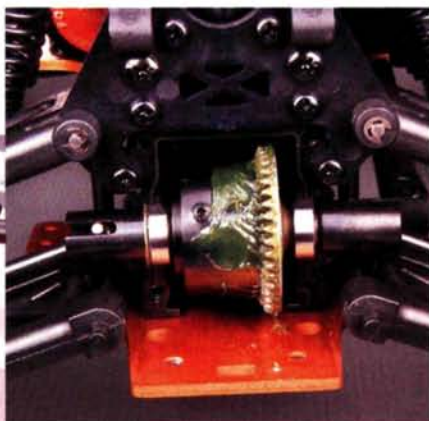
upstream. For braking, the Titan has a pair of steel brake discs that are keyed to the top spur shaft. Four fiber pads on three steel calipers are employed to slow the beast. One benefit of this setup is that having the brakes keyed to the top shaft allows the slipper to act as a poor man's ABS.

Although it didn't present a problem during testing, the transmission is exposed to off-road debris, and this creates the potential for small rocks and woodland animals to become lodged in the gear train, thereby bringing the truck to a screeching halt. The front and rear diffs are sealed 1/8-scale standard buggy issue with steel ring-and-pinion gears; they're joined to the center tranny outdrives by steel dogbones. The rear outdrives use dogbones to send the Titan's torque to the wheels; up front, OFNA spec'd "CVA" universal axles.

ENGINE AND ACCESSORIES. OFNA went beyond the expected .21 and spec'd the largest big-block engine yet: a Force .25. At first glance, it might not look any larger than a Force .21; that's because the cases are identical. The inner case bore has been massaged to accommodate the larger displacement ABC piston and sleeve. The Force .25 has an 11-fin cooling head, a 3-shoe clutch and a steel, 2-speed clutch bell. The round-port, rear-exhaust engine has a 2-needle slide carb, and the .25 is mated to a polished aluminum header and tuned pipe. The Titan has a 125cc primerless fuel tank with a molded pressure fitting and a large, spring-loaded cap for quick pit stops.

SUSPENSION AND STEERING. Handling the weight of the Titan alone would be a test of any suspension; doing so under load calls for some beefy components. The Titan's fully independent suspension uses pivot balls for articulation and is damped by eight aluminum-body shocks. Interestingly, the shocks are mounted on the upper suspension arms instead of on the lowers.

OFNA chose large, molded upper and lower A-arms; there are two shock-mounting holes up top and a single shock position on the suspension's upper A-arm. Threaded shock bodies make preload adjustment a snap, and the shocks feature silicone protectors to shield the shafts from off-road grime. The Titan's pivot-ball hubs enable precise camber setting and track width; in



Left: OFNA specs big molded gears for its center-mounted tranny plus steel helical gears to send the power to its heavy-duty slipper; note the dual-disc brake rotors on the upper transmission shaft. **Above:** a steel ring and pinion and sealed bevel-gear diff stand up well to the Titan's .25 power.



ELECTRONICS & ACCESSORIES

Airtronics Blazer Sport transmitter

Although the Blazer Sport doesn't have all of the features and beeps of the other Airtronics radios, it's a name-brand unit with the requisite items to run the Titan, such as servo-reversing, throttle/steering trim, a charging jack and an LED power indicator.

Airtronics 94161 steering servo

The hardest-working component on the Titan is the truck's steering servo. The big tires would immobilize a weaker steering unit, but the dual-bearing 94161's 144 oz.-in. of torque keeps up with the Titan's needs.

Airtronics 94102 throttle/brake servo

At 40 oz.-in. of torque, the 94102 is sufficient for throttle duties but is under-powered for the big truck's braking needs. The servo operated reliably throughout testing, but I would have preferred something with a bit more pull.

OFNA glow starter and fuel bottle

You won't need to pick up much of anything else at the hobby shop when you take home the Titan. OFNA includes a glow starter, a fuel bottle and a nice array of tools to get you up and running quickly.



YOU'LL NEED

- Fuel
- 12 AA batteries

the rear, the truck has a lower pivot ball and turnbuckle upper link. Large steel turnbuckles make for easy front and rear toe adjustments. The Titan uses standard 17mm drive hexes, and this allows you the choice of running big stomper split chevrons or subbing smaller rims and tires from the Dominator (or any 1/8-scale machine, for that matter).

Steering the Titan is an easy task, courtesy of Airtronics' 144 oz.-in. 94161 servo and bearing-supported bellcrank. Even when the truck is stationary, it isn't a problem to move its tires from side to side.

BODY, WHEELS AND TIRES. The Titan's body has angular lines that continue the aggressive overall look of the truck; the six-color pre-screened body is well detailed with bold graphics and plenty of scale accents. Mirrors and an off-road light bar add a scale touch to the truck, but the light bar blocks direct access to the glow plug. Large chrome rims and bumpers accent the Titan nicely, and the truck is outfitted with impressive 4.5x5.75-inch tires. The aggressive split-chevron pattern resembles an off-road version of the old Goodyear Gatorbacks.



THIS TRUCK IS HUGE, BRAWNY AND POWERFUL!

At idle, the Titan emits a low, aggressive burble that makes it sound like the big monster that it is. The 3-shoe clutch engages smoothly, and the truck spools up to speed quickly under power despite the massive treads. OFNA makes good use of the .25's power band with a quick transition to second gear at approximately 3/4 throttle. The final gear accelerates the truck with authority to its top speed of 35mph.

LIKES

- Purpose-built monster chassis.
- .25 engine runs smoothly and has bragging rights.
- Very strong steering servo and fail-safe included.

(The brakes slow the truck's momentum well, but hard braking leaves you wanting a little more pull from the servo.) I was impressed at how easily the truck handled decreasing radius turns at speed; I expected it to have a lot more chassis roll from weight transfer than it actually exhibited. The stock suspension is well suited to a variety of terrain; the spring and fluid selection works with the big tires. Moving at various speeds and using various approaches, the Titan had little problem climbing stairs, and it took me only a few minutes to realize that the

truck has sufficient clearance to go up the stairs as quickly as it can come down. The shocks damped the big truck's landing off some big jumps with only some modest bounce on the rebound.

I thought it would be fun to take the Titan for a few laps around our local racetrack—Xtreme RC in New Milford, CT. The big tires and eight shocks soak up the bumps well, and the strong servo gives the truck plenty of steering authority despite the monster's 13 pounds. It didn't take me long to become totally comfortable with the truck's handling, and with each lap, I rolled progressively faster through the course. Although the Titan wasn't designed to be a racer, I was pleasantly surprised at how well it handled the tight and technical course; before long, I was pulling second gear on the straights and taking extended flights off the track's tabletop. The most fun was turning into the corners at the last moment and using the .25's torque to power-slide the rest of the way around the bend.

THE VERDICT

The Titan presented an unexpected surprise when we opened the box and an even bigger surprise when we opened the throttle. This truck is huge, brawny and powerful, with a durable chassis and driveline that scream "monster!" The .25 engine, aided by its solid 2-speed, provides good torque and speed, and the handling is surprisingly nimble despite the Titan's high-CG chassis. The Titan isn't cheap by hobby standards, but it incorporates many big-ticket accessories that justify the cost. Monster-truck enthusiasts who can come up with the coin for the Titan will find that the truck's size and performance are a great return on the investment.

DISLIKES

- A stronger brake servo would be preferable.
- Light bar blocks glow-plug access.

SOURCE GUIDE

AIRTRONICS (714) 978-1895; airtronics.net.
OFNA (949) 586-2910; ofna.com.
SIDEWINDER FUELS distributed by Morgan Fuel
 (800) 633-7556; morganfuel.com.

TEST GEAR

Sidewinder Backyard Basher 20-percent nitro

Throughout testing and subsequent stomping with the Titan, I used Sidewinder 20-percent nitro Backyard Basher blend; it provided easy starts and good power without over-taxing the engine. The Basher blend also includes extra lube to keep the engine happy during extended runs.



THE COMPETITION

	ENGINE	TRANSMISSION	REVERSE	SHOCKS	WHEELBASE	STARTER	RADIO	STREET PRICE	REVIEWED
DuraTrax Thunder Quake	.21	2-speed	Yes	4	14.1 in. (360mm)	Pull	DuraTrax	\$520	4/02
OFNA Titan	.25	2-speed	No	8	13 in. (330mm)	Pull	Airtronics Blazer	\$739	12/02
Tamiya Terra Crusher	.18	2-speed	Yes	8	14.1 in. (360mm)	Electric	Tamiya AdSpec	\$409	3/02
Thunder Tiger EK-4	.70	Single-speed	No	7	12.4 in. (315mm)	Shaft	Not included	\$520	1/02*
Traxxas T-Maxx	.15	2-speed	Yes	8	12 in. (305mm)	Electric	Traxxas TQ3	\$409	11/02

Prices vary with dealer. *RC Nitro

Tamiya Beams Integra TL-01LA

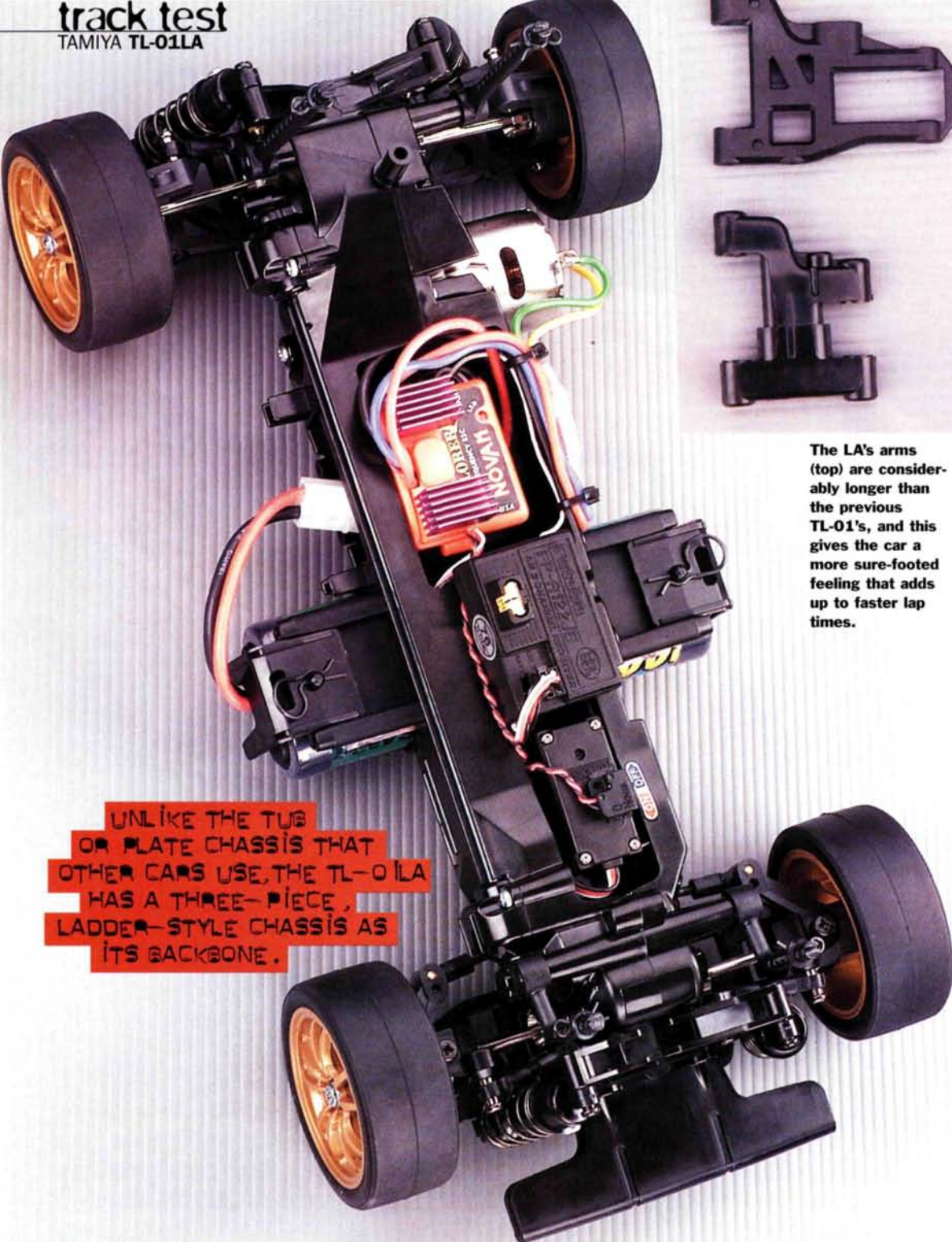


PHOTOS BY PETE HALL



TAMIYA HAS A LONG HISTORY OF OFFERING HIGH-QUALITY KITS aimed at all levels. The TL-01 platform has been a staple in Tamiya's lineup; it even has a class dedicated to it at Tamiya Championship Series (TCS) regional events. With its shaft drive, easy to assemble monocoque chassis and limited adjustments, the TL-01 has found a perfect niche. The newest chassis, the TL-01LA (long arm), builds on its predecessor's achievements and incorporates an updated suspension for better control and drivability. The Beams Integra is the first body kit to be offered with the new "LA" chassis, and we hope to find that the high-performance import shell is well matched to a high-performance import chassis.

LONG-ARMED FOR BATTLE

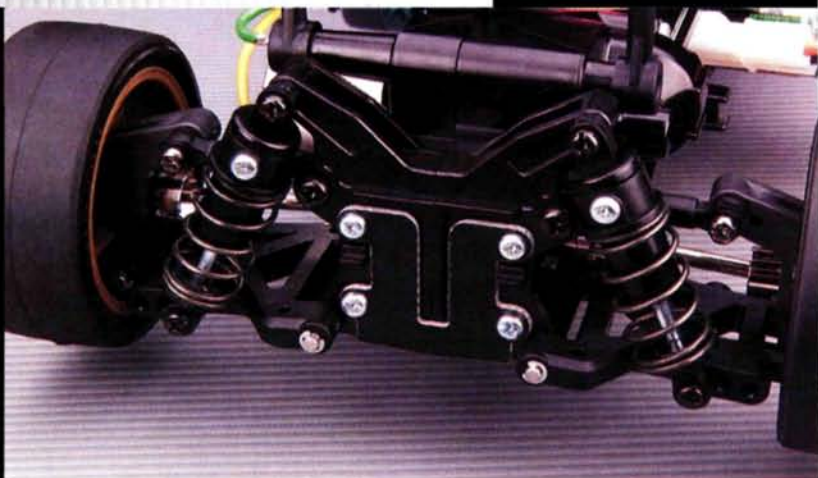


The LA's arms (top) are considerably longer than the previous TL-01's, and this gives the car a more sure-footed feeling that adds up to faster lap times.

UNLIKE THE TUG OR PLATE CHASSIS THAT OTHER CARS USE, THE TL-01LA HAS A THREE-PIECE, LADDER-STYLE CHASSIS AS ITS BACKBONE.



Left: threaded rods replace the non-adjustable camber links from the previous TL-01. You can also see the new capped front A-arm, hub carrier and E-clip-retained hinge pins. Right: a fiberglass brace holds the rear of the chassis where the halves come together. A second bumper is also included in the kit, if you are worried about being rear-ended.



DATA CENTER

VEHICLE TYPE 4WD shaft-drive sedan

BEST BUYER Entry-level and spec-class racer

KIT RATINGS (poor, satisfactory, good, very good, excellent)

Instructions Excellent

Parts fit and finish Very good

Durability Very good

Overall performance Good

SPECIFICATIONS

MANUFACTURER Tamiya

MODEL TL-01LA

SCALE 1/10

PRICE (varies with dealer) \$129

DIMENSIONS

Wheelbase 10.08 in. (256mm)

Width 7.28 in. (185mm)

WEIGHT

Total, as tested 54.6 oz. (1,548g)

CHASSIS

Type Three-piece monocoque

Material Injection-molded plastic

DRIVE TRAIN

Type Dual-gearbox shaft drive

Primary 19-tooth pinion, 32-tooth spur gear

Transmission ratio 4.73:1

Final drive ratio 7.96:1

Drive shafts (F/R) Dogbones

Differentials Bevel-gear

Bearing type Plastic and bronze bushings

SUSPENSION

Type (F/R) Lower A-arms with threaded camber links

Shocks Friction, non-oil-filled

WHEELS

Type 6-spoke white, 26mm

TIRES

Type 26mm slicks

KIT FEATURES

CHASSIS. The plastic chassis is quite different; unlike the tub or plate chassis that other cars use, the TL-01LA has a three-piece, ladder-style chassis as its backbone. All of the mounting points for the A-arms, camber links and shocks are molded into the chassis instead of having separate shock towers and hinge-pin mounts. This process reduces the parts count and speeds up assembly, but it also decreases adjustability. The front and rear gearboxes are integral with the chassis, and the drive shaft connects them through a channel on the right side of the chassis. The battery is mounted perpendicular to the chassis, aft of center and just in front of the rear-mounted motor. The channel for the battery pack will accommodate only stick packs. A plastic bumper protects the front end, and a new fiberglass brace ties the rear of the chassis together. A second bumper on one of the parts trees can be installed in lieu of the fiberglass piece in back but isn't really necessary.

DRIVE TRAIN. The drive system isn't the most efficient one you'll see with dual three-gear gearboxes, but the design is well proven and very durable. Motor power is transferred through a set of counter-gears to the bottom-mounted gear diff and the metal upper drive shaft. The front gearbox is spun by the drive shaft and also uses a gear diff. Except for the counter-gear, which is equipped with bronze bushings, the entire drive train rotates on plastic bushings. The motor-mounting plate is actually a part of the chassis and features predrilled mounting holes with a pinion tooth count to make the gear mesh trouble-free. Plastic doesn't dissipate heat well, so make sure that you let the motor cool down between runs. Steel dogbones send power from the diff outdrives to steel axles, which are fitted with plastic drive hexes.

SUSPENSION AND STEERING. Some major changes have surfaced with the TL-01's "LA" designation. Gone are the two-piece front and rear H-arms, which have been replaced with longer, one-piece molded A-arms. The added length changes the suspension geometry and should improve maneuverability. Previous TL-01 cars used hinge-pin screws to connect the arms to the chassis and the hubs. Now, real hinge pins retained by E-clips hold everything together. This setup is quite a bit lighter; plus, it accustoms newcomers to working with the more conventional configuration. New front and rear molded hub carriers look more durable than the parts they replace. The rear hubs have multiple mounting positions for the outer camber link to alter the roll center.

Without a doubt, one of the biggest improvements to the LA is the inclusion of adjustable links for camber and toe-in. Friction shocks provide damping and are directly connected to the chassis; furthermore, they now come with softer springs for a more sure-footed feel than the old springs had. The rear arms have three lower shock-mounting options, while the fronts have two. With the limited space inside the chassis, Tamiya opted



Left: go ahead, try to break one of these gears! Super-beefy 0.06-module (metric 48-pitch) gears send power from the motor to the wheels. You can also see the bronze bushing provided for the "spur gear." **Below:** three sets of numbered motor-mounting holes help to make the gear mesh more precise. It does, however, limit pinion choices, unless you purchase the optional speed-tuned gear set.

for a direct link from the servo to the front steering blocks. The included servo-saver will protect the internals in the event of a crash, and the threaded links will make toe-in settings much easier.

BODY, WHEELS AND TIRES.

I spent more time placing the decals on the body than on building the kit—often the norm for Tamiya bodies. A brand-new



Acura Integra shell comes complete with decals to top off the new chassis. With details such as hood scoops and air intakes, Tamiya has done its usual masterful job re-creating this class-winning design. This version of the Integra went on to a 1-2 finish in the Tokachi 24-hour endurance race last year. Newcomers will like the window decals and one-color paint scheme, as the box art can be replicated without having to mask off the window, clear-window fans will be disappointed to find that window masks are not included. Twenty-six-millimeter-wide slick tires get glued up to white six-spoke rims. Tire inserts are not provided, but any 26mm insert would fit. For play, the tires are fine without inserts.

INCLUDED ELECTRONICS. A sealed-endbell Mabuchi motor comes in the box with the car to get you up to speed. Beginners will appreciate the simplicity of the 'Buchi (no brushes or springs to deal with), and the top speed is decent as well. To reduce racers' expenses, the TL-01 spec classes in TCS events require entrants to use the kit's sealed-endbell Mabuchi or Johnson motor. A mechanical speed control is provided, but I tossed in an electronic unit. This one upgrade will increase run time and lighten the car; plus, the throttle response will be much smoother.

BUILDING & SETUP TIPS

The TL-01LA is easily assembled in an afternoon, thanks to the simple monocoque construction of the chassis and Tamiya's excellent instruction manual. If the Integra is your first car, you shouldn't have any problems getting it together. Here are a couple of additional pointers to help you out.

STEPS 7 TO 9. The manual tells you to use ceramic grease on the gears, but the petroleum base in the lube attacks the plastic and shortens the gears' lives. Run them dry, or use Aero Car or White Lightning lubes instead.

STEP 9. Other than bearings and a motor, the next most important thing you can change to increase top speed is the speed-tuned gear set. It increases the final drive ratio of the transmission, which will give the car more top speed.

STEP 10. The gears are not 48-pitch but 0.06-module (metric 48-pitch). I tossed the kit pinion and used a Robinson 0.06-module pinion. The Robinson is a more durable gear, as the kit's pinion is made of a soft metal.

STEP 12. I noticed that the suspension was binding on the rear A-arms, so I trimmed some material off the rear of them at both the inner and outer pin points.

STEP 29. Detailing the body takes a lot of time. To make placing and relocating the decals easier, mix three drops of dish soap with some water and rubbing alcohol in a spray bottle. This will give you additional time to move a decal if you don't position it perfectly the first time.

YOU'LL NEED

- Transmitter, receiver and two servos
- 6-cell battery pack (stick packs only)
- Polycarbonate-compatible paint
- Tire glue
- Charger

FACTORY OPTIONS

- TA-03 ball differential—item no. 53267
- Oil-filled shocks—53155
- Universal drive shafts—53418
- On-road hard spring set—53440
- Speed-tuned gear set—53342
- Ball-bearing set—53292

Futaba Magnum Sport and Novak Explorer 2 ESC

Fresh from a face-lift, the newest Sport has improved ergonomics and balance. This AM radio includes a Futaba 3003 standard servo and receiver and a Novak Explorer II ESC. This is a great entry-level radio system that beginners can transfer from car to car.



Additional items used to complete the TL-01LA

Tamiya Type S motor

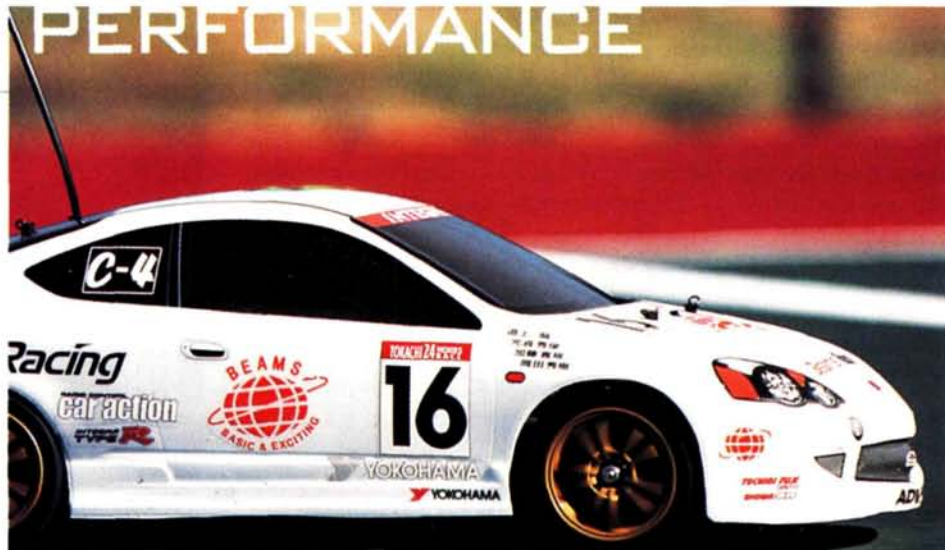
Trinity 3000mAh Sanyo HV sport pack

Reedy Quasar charger

TAMIYA SUPER STOCK TYPE S MOTOR

Tamiya has a number of open-endbell motors for various car, track and speed needs. For the TL-01LA, I wanted to try the newest motor: the Super Stock Type S. The Type S is a rebuildable motor similar to those used state-side in ROAR stock classes—with one difference: it has a 23-turn armature, which should spool up faster and provide more top speed than our 27-turn armatures. Other features include low-profile bushings, a locked endbell with fixed timing, brush dampers, brush heat sinks and a full armature for maximum torque. The capacitor system on the Type S is completely different from anything I've ever seen. The capacitors are actually mounted on a small circuit board that slides between the motor's positive and negative terminals. In the event that the capacitors are damaged, the little wafer board can easily be replaced.

I spent some time with the Type S on my dyno, playing with various spring and brush settings. I was surprised at how well the stock brushes and springs worked compared with the aftermarket ones. I feel this would be a great motor for clubs and tracks around the country to use as their spec motor for the growing F201 classes.



I was very interested to see how the changes made to the suspension would affect the handling characteristics compared with previous TL-01s. I went to a nearby parking lot for testing, and while the Trinity HV pack was charging, I threw down a few dots to create some lanes and turns. The LA was much more stable

LIKES

- Easy assembly.
- Built like a tank.
- Adjustable toe-in and camber.
- Handles very well and is very fun to drive.

from the get-go than the previous TL-01. The softer springs let the chassis work much more effectively than the older, super-firm springs. After I drained a few packs with the kit Mabuchi, I replaced it with Tamiya's new Type S rebuildable motor. The extra horsepower would definitely put more strain on the chassis and amplify both its positive and negative characteristics. I stuck with the kit's 19-tooth pinion even with the hotter motor, and the LA got up and boogied in a hurry. With the higher corner speed, the kit tires showed signs of folding because of the absence of inserts. I swapped the kit tires for some of Tamiya's own B2 slicks, and the car instantly handled better. The chassis exhibited signs of chassis roll, but switching to oil-filled shocks would fix that. Overall, the car was a lot of fun to drive hard, tap the brakes and power slide through the turns. I believe this will be the car to beat in the TL-01 Spec classes, and it will be legal for the 2003 racing season.

THE VERDICT

The new TL-01LA is an all-around better performing car than its older cousin. Racers have been asking for adjustable links and a plusher suspension, and their requests have now been granted. The chassis is simple enough for most people to build and maintain. It's a well-put-together car, and the TL-01LA will reward buyers with less time spent wrenching and more time spent actually driving. What the TL-01LA lacks in high tech, it makes up for with "high fun."

DISLIKES

- Tire inserts aren't included.
- Friction dampers included instead of oil-filled shocks.

SOURCE GUIDE

FUTABA distributed exclusively by Hobbico/Great Planes Model Distributors Co. (800) 637-7660; futaba-rc.com.

NOVAK ELECTRONICS INC. (949) 833-8873; teamnovak.com.

REEDY a division of Team Associated (714) 850-9342; teamassociated.com.

TAMIYA AMERICA INC. (800) 826-4922; tamiyausa.com.

TRINITY PRODUCTS INC. (732) 635-1600; teamtrinity.com.

THE COMPETITION

MODEL	CHASSIS	DRIVE TRAIN	BALL BEARINGS	DIFFERENTIALS	AXLES	ALSO SOLD RTR	STREET PRICE (KIT)	REVIEWED
Associated TC3 Racer	Molded semi-tub	Shaft	Complete set	Ball	Universals	Yes	\$174	9/01 RTR tested*
HPI RS4 Sport 2	Fiberglass	Dual-belt	Complete set	Bevel gear	Dogbones	No	\$160	11/00
MRC Academy STR-4	Molded semi-tub	Shaft	Bushings	Bevel gear	Dogbones	Yes	\$129	4/00
Tamiya TL-01LA	Plastic monocoque	Shaft	Plastic and bronze	Bevel gear	Dogbones	No	\$129	12/02
Traxxas 4-TEC	Molded composite	Dual-belt	Drive train only	Ball	Universals	Yes	\$134	9/01 RTR tested*

Partial listing; category is too large to include all vehicles. Price varies with dealer. *RTR 4WD Electric Touring-Car Shootout



Mugen MST-1

LAST YEAR, MUGEN SURPRISED US by announcing that it would manufacture an all-new, nitro-powered, 1/10-scale racing truck and teased us with 3D drawings of the proposed machine. It has been a year since we got our first glimpse of the MST-1, and now it's here in production form. The new truck combines the best of Mugen's 1/8-scale buggy technology with the current state-of-the-art nitro-truck design (plus some inspiration from Team Losi's Triple-XNT design) to deliver what appears to be a very capable race truck. The track will tell the real story.

PHOTOS BY WALTER SIDAS

mugen goes from **Big Buggies**
to a **trick truck**





If you're thinking it looks very similar to Losi's nitro truck, well, you're correct. But the MST-1 does have lots of details that make it a unique truck in its own right.

Mugen adopted the clover-shape brake hub concept, which makes for a longer-lasting brake rotor. When something works, you use it.



Above: the rear-mounted battery box is fully enclosed, so you can throw your zip-ties away.
Left: Mugen supplied this sweet Rex pipe for testing. The header looks as though it would flow poorly because of the "dead end" where the U-bend attaches, but the interior surface is smoothly radiused.

DATA CENTER

VEHICLE TYPE 1/10-scale 2WD nitro-powered race truck

BEST BUYER Truck racing enthusiasts

KIT RATINGS (poor, satisfactory, good, very good, excellent)
Instructions Very good
Parts fit/finish Excellent
Durability Very good
Overall performance Very good

SPECIFICATIONS

MANUFACTURER Mugen Seiki
MODEL MST-1
SCALE 1/10
STREET PRICE \$459.99

DIMENSIONS

Wheelbase 11 in. (280mm)
Width (F/R) 12.8 in. (325mm)
Length 16.73 in. (425mm)

WEIGHT

Total, as tested 70.3 oz. (1,993g)

CHASSIS

Type 3mm plate
Material Clear anodized aluminum

DRIVE TRAIN

Type 3-gear transmission
Primary Clutch bell/spur
Transmission ratio 3.28:1
Final drive ratio 11.57:1
Drive shafts Universal axle
Differentials Ball
Bearing type Rubber sealed

SUSPENSION

Type Lower A-arm with adjustable upper-control link
Damping Aluminum, oil-filled shocks

WHEELS

Type Plastic dish

TIRES

Type (F/R) Pro-Line Edge/Pro-Line Bow Ties

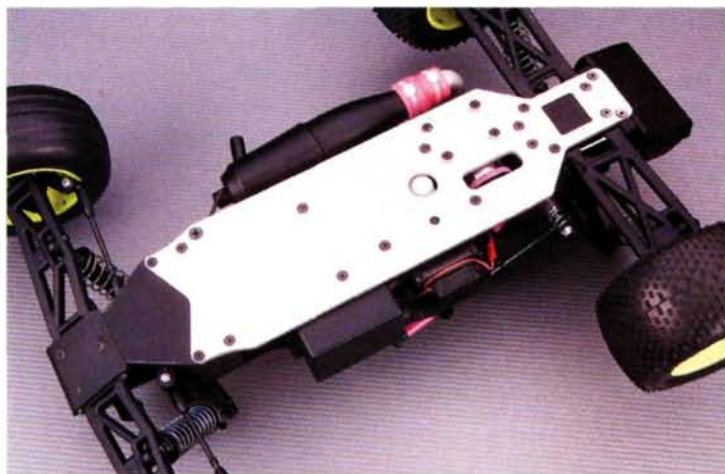
ENGINE AND ACCESSORIES

Engine NovaMugen MT12
Carb 3-needle slide
Exhaust Aluminum tuned pipe w/aluminum header
Fuel capacity 75cc

MUGEN SPEC'D A 3MM-THICK, CLEAR-ANODIZED 7075 ALUMINUM PLATE AS THE FOUNDATION OF THE MST-1.

KIT FEATURES

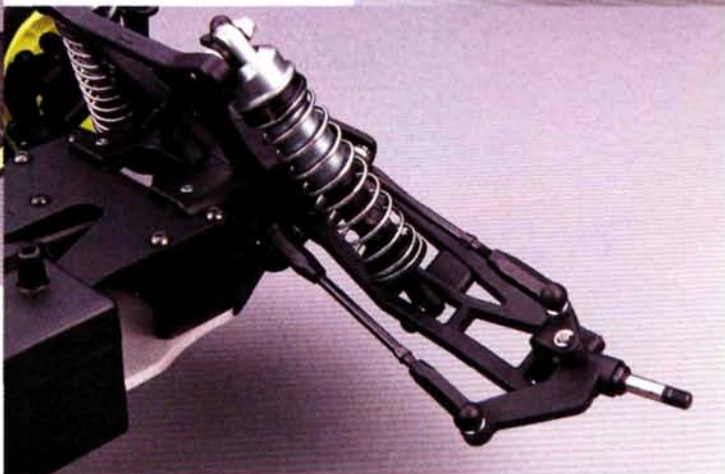
CHASSIS. Mugen spec'd a 3mm-thick, clear-anodized 7075 aluminum plate as the foundation of the MST-1. The bottom is smooth from front to back, thanks to the countersunk screw holes. Holes under the fuel-tank pick-up and the transmission allow them to be mounted as low as possible in the chassis for a lower CG. The truck gets its front kick-up from a molded front bulkhead that is protected by a mini-bumper. A composite upper deck runs from the front bulkhead to the engine, and an aluminum brace that spans from the upper deck to the transmission ties the top chassis components together for an ultra-rigid setup. The steering servo is mounted horizontally on the underside of the upper deck, and the throttle/brake servo is mounted vertically on the right



side. A receiver box just in front of the throttle servo protects the receiver from the elements and spilt fuel. The 75cc fuel tank is centered and mounted onto the upper deck instead of to the chassis, as on other race trucks. Two rubber grommets insulate the tank from vibration, which reduces fuel foaming.

DRIVE TRAIN. A light aluminum flywheel allows the engine to spool up quickly. A two-shoe clutch engages the supplied 17-tooth clutch bell. The clutch bell is supported by two large, flanged ball bearings: the larger the diameter of the bearing, the less chance of bearing failure. The bell is mated to a 5mm-thick, 60-tooth spur gear that is secured to a large-disc slipper clutch with two screws. To relieve stress on the mounting screws, two dimples on the back of the gear fit tightly into two matching holes in the slipper plate. The top shaft is home to a steel gear that meshes with a composite idler gear. The idler gear mates with a large-diameter ball differential. Universal drive shafts are spun by steel outdrives, and 12mm plastic hexes mate the rear wheels to the axle. The drive train is very solid, but Mugen uses solid pins throughout the drive train, and they slide out easily during assembly and maintenance.

Left: the MST-1's chassis has a generous access hole for the flywheel and openings that allow the fuel tank and transmission to sit as low in the chassis as possible. **Right:** the MST-1's large-diameter shock bodies give the truck plenty of cush, and rubber shaft gaiters keep track junk away from the seals. It's a very 1/8-scale-buggy-like package. **Below:** turnbuckle camber links are attached to top-mounted ball ends, and this makes it easy to alter roll center by stacking washers beneath the ball end. The turnbuckle's offset flats are a nice touch, but the flats themselves are tiny and easily stripped.



SUSPENSION AND STEERING. The MST-1 sports a standard A-arm suspension with adjustable upper-link in the front and rear. Hand-fitting isn't required on the suspension arms, thanks to the high-quality molding. All of the arms move freely and fall under their own weight. The front upper links are mounted in front of the shock tower, and two mounting locations are available. The rear upper links connect the rear hub to the shock tower, and six positions are available. Aluminum, oil-filled, coil-over shocks support the chassis on all four corners. These smooth, large-volume shocks feature dual O-ring seals, and rubber boots on the bottom prevent them from getting scored. Six mounting positions are available for each of the shocks. The ball studs used for the suspension and steering have 2mm socket heads for easy installation.

BUILDING & SETUP TIPS

Thanks to the detailed instructions, the MST-1 is very easy to build, but there are always a few tips to pass along to make assembly easier.

STEP 1. DIFF-NUT INSTALLATION. A small nylon diff nut is seated in a molded-plastic housing, and it can be a pain to get it to seat properly. Take the screw that holds the diff together and slide it through the diff side of the housing. Thread the nut onto the end, and pull the screw and nut back through the housing to seat the nut. When the nut has been properly positioned, unscrew the screw.

STEP 1. DIFF BALLS. The diff balls fall right through the holes in the diff gear. Coat the holes with a little diff grease to hold the balls in place until you place the gear on the outdrive.

STEP 4. BRAKE HEX. Small tabs on the back of the brake hex prevent it from sliding all the way onto the brake shaft. You won't be able to attach the E-clip that holds it in place. File the small tabs on the back of the hex until you have enough clearance for the E-clip.

STEP 5. SETSCREWS. 3x3mm setscrews hold the front upright pins in place if the E-clips fall off. Don't get the 3x3mm setscrew confused with the 3x2.6mm setscrews that are used to hold the pins in the universal joints.

STEP 6 AND 16. TIE RODS. Assembling the tie rods can be a major pain. Thread the ball cup onto the tie rods until just a few threads catch. Pop the tie rods on the truck and finish threading them on with the supplied adjusting tool.

YOU'LL NEED

- Transmitter and receiver
- Steering and throttle servos
- Receiver battery
- Fuel and fuel bottle
- Thread-lock
- Starter box
- Ni-starter
- Paint

An adjustable tie rod connects the steering servo to a dual-bellcrank steering system. Bosses in the upper deck and the lower plate capture the aluminum bellcrank posts at both ends. The main bellcrank features an adjustable servo-saver, and the two bellcranks are connected by a fixed-length link. Adjustable turnbuckles connect the bellcranks to the steering knuckles.

BODY, WHEELS AND TIRES. The MST-1 includes a Pro-Line Crowd Pleazer body with overspray film and window masks. I painted the body with Parma Faskolor paints. Pro-Line Bow Tie tires for the rear and Pro-Line

Edge tires up front are standard and fitted to Mugen's lightweight, yellow dish wheels. Instead of crosspins, 12mm hexes interface with the wheels; this limits aftermarket wheel options, so stock up on Mugen rims.

ENGINE AND ACCESSORIES. The MST-1 is available with a NovaMugen MT12 rear-exhaust engine, and this is the version of the kit we tested. It breathes through a large-bore, 3-needle, slide-type carb; it's also available with a rotary carb. It features a large, 9-finned aluminum heat-sink head, ABC construction and O-ring seals. The engine has a claimed output of

1.15hp and a peak rpm of 36,500. The header is very compact and allows exhaust to travel smoothly from the exhaust port to the Rex tuned pipe. It's secured to the chassis with an 1/8-scale-style pipe mount.



A FISTFUL OF THROTTLE BROKE THE REAR TIRES FREE IN A SPRAY OF SOIL

After breaking in the MST-1's NovaMugen MT12 engine and trimming out the radio in a parking lot, I packed up my gear for a trip to the track. It was hard to resist speed-testing the truck on blacktop, but I didn't want to waste the knobs. Once in the dirt, I was free to cut loose. A fistful of throttle broke the rear tires free in a spray of soil as the Pro-Line Bow Ties excavated the loose dirt on top of the hard pack. The MST-1 hooked up after a few feet, and the front end began to get light and twitchy as the engine got into its powerband and made the truck want to wheelie. Almost as soon as I got on the gas, I had to reach for the brakes to set up for the first turn. As the MST-1's weight transferred to the front end, the tires dug in and the truck showed impressive steering. The rear end made a little hop as it fought for traction through the rutted corner under braking, but the MST-1 didn't lose its line. I carefully picked through the

LIKES

- Hex-drive ball studs.
- Easily removable upper deck.
- Enclosed receiver box—no zip-ties required.
- Compact header is less prone to crash damage.

also proved capable of taking the edge off big-air landings, and tackling smaller doubles or single jumps was easy, without any need for extra throttle input to level the truck after takeoff.

THE VERDICT

Losi fans may enjoy pointing out the similarities of the MST-1 and the Triple-X NT, but what really matters here is track performance, and the Mugen MST-1 is nothing if not a performer. It's as tuneable as the Losi, Associated and Kyosho machines with which it competes, and the MST-1 is track-ready straight from the bench. If you don't already have an engine and exhaust package, you should definitely go for the MST-1 kit that includes the NovaMugen engine and Rex exhaust; it's a very competitive setup and well matched to Mugen's very competitive truck.

technical course and made good use of the MT12 engine's precision slide carb. Braking was consistent from corner to corner, and there weren't any signs of fading once I dialed out a little slop that had developed as the parts wore-in. As the already-bumpy track became more rutted with each lap, the MST-1's suspension began to shine. The large dampers weren't as responsive to small bumps as other nitro race trucks I've driven (at least as set up according to the Mugen manual), but the truck soaked up big hits very well. And with a top speed of 36mph, it doesn't take a very large bump to qualify as a "big hit"! Not surprisingly, the suspension

DISLIKES

- Accepts only Mugen wheels.
- Crosspins in the transmission fall out easily during maintenance.

SOURCE GUIDE

AIRTRONICS (714) 978-1895; airtronics.net.
MUGEN USA (949) 707-5607; mugenracing.com.
BYRON ORIGINALS 712-364-3165; byronfuels.com.
PRO-LINE (909) 849-9781; pro-lineracing.com.
PARMA/PSE (440) 237-8650; parmapse.com.

Mugen Seiki

20% race fuel

This fuel was good enough to win Mugen an 1/8-scale, on-road world championship; it's more than good enough for me! Blended by Byron for Mugen, this fuel contains a 12-percent synthetic/castor-oil blend to protect engines, even when they are run too lean.



Mugen 5-cell receiver pack

I installed a Mugen 1000mAh, hump-style receiver pack in the battery box of my MST-1. It fits snugly in the box, and it gives my truck all the power it needs to complete grueling, hour-long A-mains.

Other items used

Airtronics M8 Radio

Airtronics 94257 steering servo

Airtronics 94102 throttle/brake servo

THE COMPETITION

	TRANSMISSION RATIO	BEARING TYPE	DRIVE SHAFT	CHASSIS TYPE	WEIGHT (OZ.)	STREET PRICE*	REVIEWED
Associated Factory Team GT	2.60:1	Rubber-sealed	MIP CVD	2.50mm 6061 aluminum	62.72	\$299.99	10/00
Kyosho Ultima ST GP	2.89:1	Metal-shielded	Steel universal	2.50mm 6061 aluminum	67.20	\$269.99	3/00
Losi Triple-XNT	4.11:1	Teflon-shielded	Steel universal	3.18mm 7075 aluminum	67.20	\$289.99	2/01
Mugen MST-1	4.57:1	Rubber-sealed	Steel universal	3mm 7075 aluminum	70.30	\$459.99**	12/02

*Price varies with dealer. ** With engine

Bergonzoni Brave 2



PHOTOS BY WALTER SIDAS

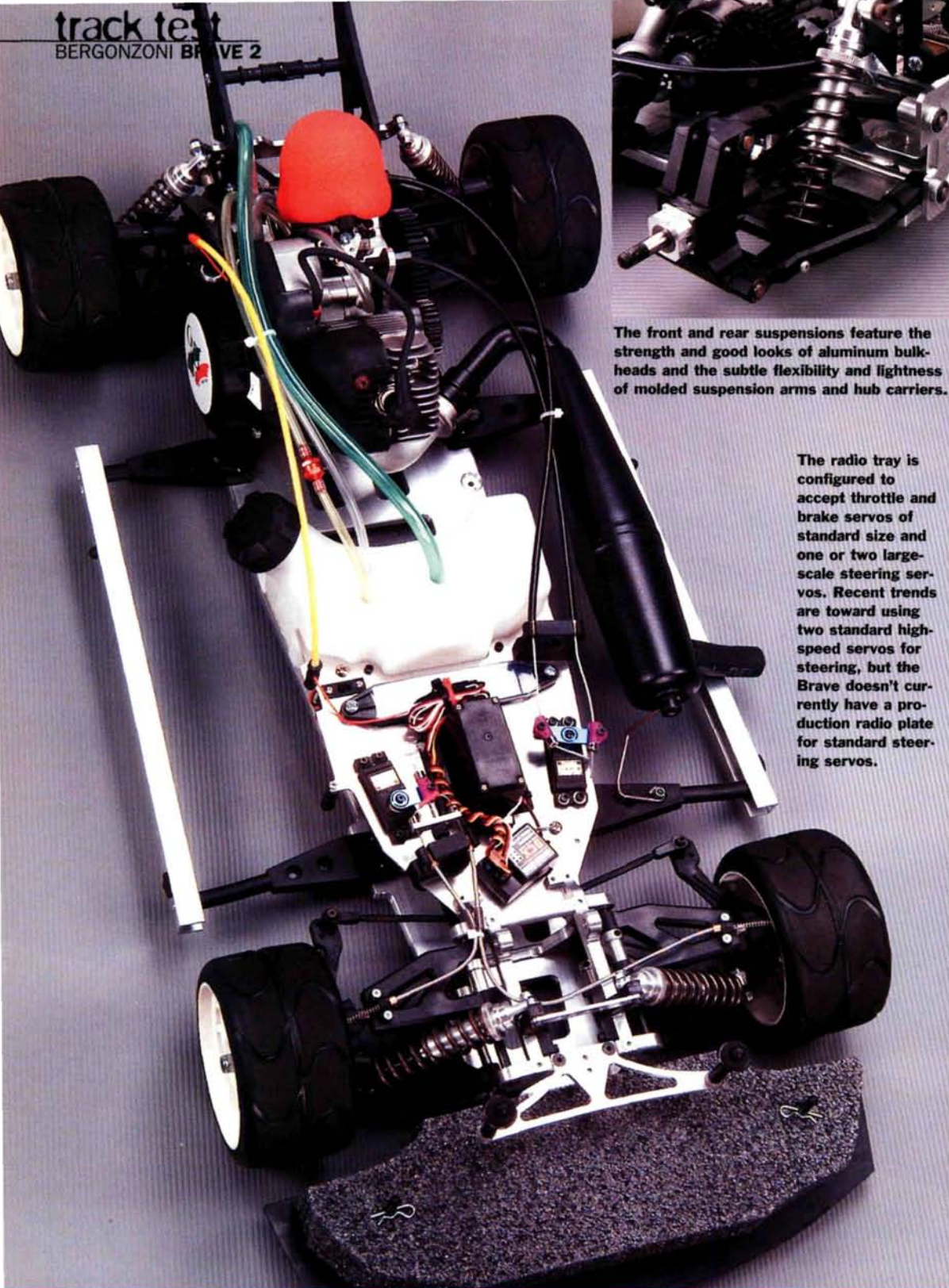


MOST OF US WANT TO OWN AND RACE LARGE-SCALE RC CARS, but when it's time to pony up the dollars, most of us fall short. The big cars are expensive, so it isn't hard to see why their popularity has so far been relatively limited.

Blackhawk RC in Vancouver, WA, hopes to fuel the growth of large-scale racing in the States. The company imports the Bergonzoni line of cars and accessories, and the sharp-looking, reasonably priced, $\frac{1}{5}$ on-road Brave 2 car is the first in Blackhawk RC's effort to allow us to fulfill our big-car dreams.

Blackhawk RC refers to the Brave 2 as a "club" racer. It does without all the eye-candy anodizing and the titanium and hydraulic parts of the most expensive $\frac{1}{5}$ -scale machines, but as the core machine of Bergonzoni's line, it has most of the essential race components and none of the unnecessary heavy metal or expense.

**BRAVE NEW WORLD—
FOR AFFORDABLE $\frac{1}{5}$ SCALE**



The front and rear suspensions feature the strength and good looks of aluminum bulkheads and the subtle flexibility and lightness of molded suspension arms and hub carriers.

The radio tray is configured to accept throttle and brake servos of standard size and one or two large-scale steering servos. Recent trends are toward using two standard high-speed servos for steering, but the Brave doesn't currently have a production radio plate for standard steering servos.

DATA CENTER

VEHICLE TYPE 1/5 on-road 2WD
BEST BUYER Intermediate to advanced RC enthusiast who wants a large-scale vehicle
KIT RATINGS (poor, satisfactory, good, very good, excellent)
Instructions Satisfactory
Parts fit and finish Good
Durability Very good
Overall performance Very good

SPECIFICATIONS

MANUFACTURER Bergonzoni
MODEL Brave 2
DISTRIBUTED Blackhawk RC Corp.

SCALE 1/5
PRICE (varies with dealer) \$879

DIMENSIONS
Wheelbase 21.2 in. (538mm)
Width 15.4 in. (392mm)

WEIGHT
Total, as tested 355 oz. (10,064g)

CHASSIS
Type Single lower plate
Material 8mm-thick aluminum with radiused edges

DRIVE TRAIN
Type Rear-wheel-drive exposed "gearbox"
Primary 25T clutch bell/42T spur gear
Transmission ratio 3.0:1
Final drive ratio 5.04:1
Drive shafts Steel dogbones
Differential Silicone-filled, planetary gear differential with aluminum housing
Bearing type Metal-shielded ball bearings

SUSPENSION
Type (F/R) Double A-arm/lower H-arm with turnbuckle adjustable upper link
Shocks Threaded aluminum-body with Teflon shaft guides and bladder seal

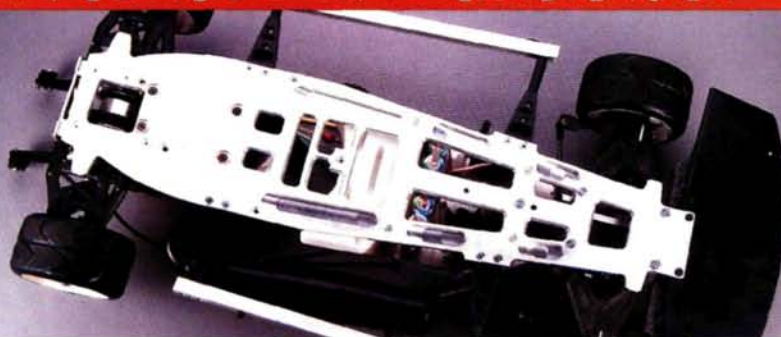
WHEELS
Type One-piece molded plastic

TIRES
Medium-compound, treaded racing tires

ENGINE AND ACCESSORIES
Engine Bergonzoni Boss 23cc pull-start engine with integrated cooling fan
Carburetor Double-needle butterfly-valve carb
Exhaust Two-piece, double-chamber tuned pipe
Fuel tank 700cc molded tank with threaded filler cap

THE BEAUTIFULLY MACHINED, 8MM-THICK, HIGH-GRADE ALUMINUM CHASSIS IS ONE OF THE BRAVE 2'S MOST IMPRESSIVE FEATURES.

The chassis plate is a nicely machined, 8mm-thick slab of aluminum. Large cutouts in strategic locations reduce weight.



KIT FEATURES

CHASSIS. The beautifully machined, 8mm-thick, high-grade aluminum chassis is one of the Brave 2's most impressive features—a slab of alloy that has been whittled into a work of art. It has nicely rounded corners in some areas and blind lightening slots in others. There are some rough edges here and there, but it's certainly a piece that machinists will appreciate. The chassis spans the length of the car and is lightly supported above by the radio tray, suspension bulkheads and the engine. It's a single-plate design that's much like the chassis on many other cars of this type.

Aluminum bulkheads are installed for the front and rear suspensions, and there's a nicely laid out aluminum radio plate that has room for one or two large-scale steering servos and two servos of a more regular size (one handles the throttle and the rear brake; the other is reserved for front braking). The mount for the receiver pack is at the rear of the radio tray, where it's attached to the fuel tank. This car requires a 5-cell sub-C pack—1 cell less than we're used to seeing power our 1/10 electric cars. These big packs have lots of servos to move around, so it's good they have gobs of reserve battery power.

DRIVE TRAIN. This couldn't be any simpler—at least, going by its appearance. The Brave 2's drive train consists of two steps of gear reduction accomplished with two pairs of very large, wide, straight-cut adjustable gears. The drive train's outer simplicity is refreshing; inside the nice machined-aluminum housing, it is more sophisticated than you might expect. Power is directed through a centrifugal 2-shoe clutch and then through the gear diff and, finally, to the rear wheels by means of thick steel dogbones.

ENGINE AND ACCESSORIES. The Brave 2's engine is listed as the Boss 23cc. This isn't a leaf-blower mill that has been converted for RC use; it was engineered by and produced for Bergonzoni. It boasts an impressive 3.5hp, and it offers tons of torque to blast the Brave 2 out of the corners at an incredible pace. An optional 3-chamber pipe is claimed to bump power output to a staggering 4.1hp.

The standard exhaust system features a bolt-on header with a spring coupler that resembles the couplers used on better 1/8-scale exhaust systems.



Above: the Bergonzoni engine is extremely strong and could easily over-power the car if you squeeze the throttle trigger too hard. It was designed for large-scale racing—no landscaping-tool ancestry here!



Left: front disc brakes are a highly recommended option for racing because they provide infinitely more stopping power and control. To prevent the steering movement from affecting the brake application, the brake arms curve over the hubs to a position that's directly over the steering pivot point.

This coupler makes a cleaner, more solid joint than the usual high-temp hose and hose clamps. The pipe is a two-chamber design with a wire mount, and a rubber extension hose gets the exhaust gases out of and away from the body.

SUSPENSION AND STEERING. Strong, very rigid, machined-aluminum bulkheads anchor the front and rear suspension. There are molded double A-arms up front and molded lower H-arm/upper-link suspension in the rear. Unlike aluminum-alloy suspension components, the molded-composite suspension will "give" in a crash and allow the Brave 2 to roll away instead of hobbling into the pits with a bent arm or broken mounting screws. The com-

SETUP TIPS

Blackhawk R/C gave us an assembled car for this track test, so I can't offer any major insights into building or setup, but here are some general do's and don'ts that everyone should follow when running a large-scale vehicle.

1. ONE-FIFTH-SCALE CARS BURN GASOLINE. Gasoline always carries the same dangers, whether it's in your lawnmower or motorcycle or RC car. Store your fuel outside, preferably in a well-ventilated area. Gasoline is more volatile than methanol, which is the main component of nitro fuel; handle it particularly carefully. A little common sense goes a long way here. If you have any doubts, ask for advice at your local gas station.

2. YOU MUST ADD OIL TO THE GAS. Gasoline doesn't contain a lubricant, but unless you really don't like your engine, you need lubrication for it. Motorcycle and snowmobile stores carry the special oil that can be mixed with gasoline. Do not use just any oil! And don't cheap out; compared with an average motocross or ATV engine, a 23cc engine screams, so you need top-shelf lubricant. If you economize here, you risk having to replace your engine quite frequently. Get a top-of-the-line lubricant from Golden Spectro, Klotz, Amsoil, or one of the other well-respected 2-stroke lubricant manufacturers.

3. THE RADIO SYSTEMS THAT PILOT THESE LARGE CARS REALLY NEED TO BE UP TO THE TASK. The cars are too big and too fast to trust to just any radio system; some race operators even mandate FM radios in their competitions. It's a matter of weight multiplied by velocity; these cars really pack a punch, so you don't want yours to get away from you. If you can afford the car, you should at least spend enough to ensure that you have a good FM radio system; I highly recommend one with PCM and fail-safe. If the signal is lost, a radio with a built-in fail-safe will return the servos to preset positions. Don't try to save money here. If a big car gets out of control, it spells danger; it isn't worth the risk.

YOU'LL NEED

- Large-scale steering servo(s)
- Two servos of standard size for throttle and brake
- 3-channel radio with servo mixing or a Y-harness
- 5-cell, high-capacity receiver battery pack
- High-quality, 2-cycle engine lubricant
- High-octane pump gasoline
- Polycarbonate paint

FACTORY OPTIONS

- Front-end upgrade kit from Brave to Bandit/Bull/LE—item no. D08290
- Brake kits for Brave (F/R)—D2099/D2098
- Modular System Differential—D20910288
- Alloy servo-saver—D08780
- Alloy rear end kit—D09005
- Brake-control kit—D08360
- Carburetor-control kit—D08380
- Rear, adjustable, aluminum wishbone kit—D08420
- Carbon radio plate—D08320
- Adjustable clutch-friction extractor—08695
- Steel pipe, muffler, exhaust manifold, muffler spring—08750
- Front anti-roll bar kit for Brave—08790
- Rear adjustable anti-roll bar kit—D20910093
- Lowered engine kit—D20910220
- Adjustable friction—D08700
- Universal carbon wing—D08180

posite arms are lighter than aluminum would be, and that gives the Brave 2's stock suspension an advantage in the unsprung-weight department.

The rear suspension's lower H-arms feature turnbuckle adjusters, which allow quick changes to be made to rear toe angle, and droop-adjustment screws to vary ride height and roll resistance. You have a choice of two lower-shock mounting holes. The upper links have a wide inner portion—almost like an A-arm—and are secured to the bulkhead with long hinge pins; this creates a little extra front-to-rear rigidity. Turnbuckle adjusters in the middle of the upper links allow quick rear-camber tweaking.

The front suspension is of the typical upper and lower A-arms variety, but there's a twist: the lower arms have considerable kick-up, but the hinge pins for the upper arms (they control the pivot angle) lie almost flat. This leads to decreasing caster in the outside suspension as it's compressed by cornering forces. The idea behind this design is to obtain a sharper steering response in the corners by reducing the caster angle while the suspension is loaded and also to enhance straightaway stability with maximum caster when the suspension is relatively unloaded, i.e., the car is going straight.

TEST GEAR



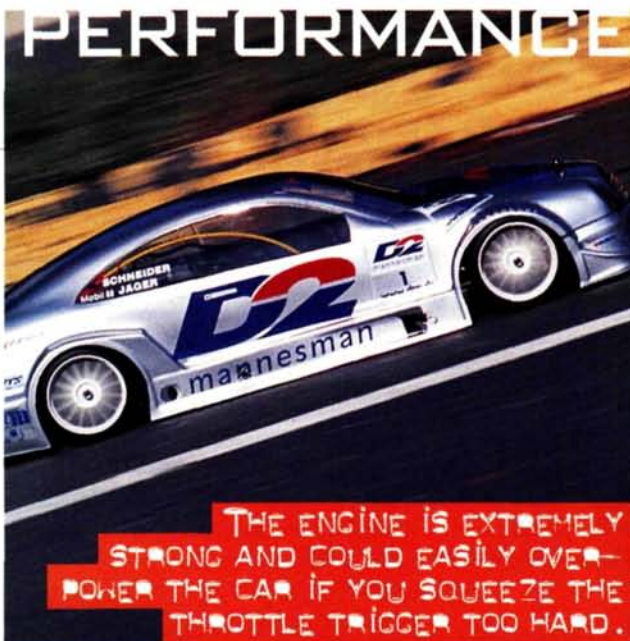
Hitec Lynx 3D radio

The Lynx 3D is Hitec's top-of-the-line radio system. It features a more solid FM signal, which is recommended for a radio system that's used to pilot one of these monsters. Additionally, it has all the fine-tuning features needed to finely adjust the endpoints for throttle, brake and steering.

Additional items used to complete the car

Hitec HS700BB large-scale steering servo

Futaba S3003 throttle and brake servos (2)
5-cell, 3000mAh receiver pack (custom-made)



THE ENGINE IS EXTREMELY STRONG AND COULD EASILY OVERPOWER THE CAR IF YOU SQUEEZE THE THROTTLE TRIGGER TOO HARD.

system that helps the engine produce a claimed 3.5hp. Whatever the number, I found the engine exceptionally strong and also controllable. Power delivery is more subtle at lower speeds, such as when coming out of tight corners, and that helps to keep the rear tires stuck to the ground. When the car picks up speed again, however, the engine gets "on the pipe" and makes the real power that gets the Brave 2 up to a very impressive mph on the straights. The stock engine is powerful enough to get the wheels spinning with less than ideal tracks—with the lesser of the two tuned pipes. I imagine that when using the optional pipe, you need a more measured, more deliberate throttle application.

LIKES

- Very powerful engine.
- Nicely machined 8mm chassis.
- Good value for money.

THE VERDICT

Bergonzoni is a strong player in the 1/5 market; it offers a wide range of vehicles to satisfy everyone from budget-minded bashers to the most discriminating racers. The new Brave 2 falls somewhere in the middle of the pack; its list of features makes it well suited to those who want more than a basic bare-bones car but don't want to spend a fortune on a super trick, top-end machine. The Brave 2 has all the essentials except front brakes, but even when you add that expense, it still has a lower price tag than a fully equipped competition 1/5 buggy or on-road car. If you're interested in graduating to the big-scale stuff, it's certainly worth a good look.

All corners are damped with oil-filled aluminum shocks, and extra-beefy, coil-over springs with humongous 3.1mm wire keep the chassis suspended.

BODY, WHEELS AND TIRES. This particular car came to us with a nicely painted and mounted Mercedes CLK GTR body, but if you buy a kit, the painting and detailing will be up to you. If you want to stick with Bergonzoni's "D2" scheme, it isn't all that difficult. A few cans of silver paint and the included decals should do the trick; just be sure to paint the car outdoors, because the overspray when painting such a large body would surely cover half the basement floor. No matter how you choose to finish the body, you'll have a very sharp, and scale-like completed shell.

The trick-looking turbine-style wheels are outfitted with nice, medium-compound rubber tires. The compound appears to offer a nice balance of traction and reasonable wear. The tires won't last a season, but they'll last longer than just few runs.

Having properly prepared the Blast 2, Kevin Hetmanski and mixed Sunoco Racing Fuel—formerly known as "CAM2" fuel—with a high-quality synthetic lubricant to maximize performance. In truth, as far as performance goes, it's probably hard to tell the difference between racing fuel and high-octane pump fuel. But we wanted the distinctive smell of burnt racing fuel and the cool fuel-can sticker!

The Boss 23cc engine fires easily and holds a good idle. The mixture settings were a little off for the test-day's temperature, but after tuning the engine for about 15 minutes (using the same general procedures as we would with a nitro engine), we had the Boss dialed in. Yes, these bigger, ringed engines take a fatter mixture setting than nitro engines, but you still have to listen for the same engine sounds, so tuning the engine for maximum, safe performance is fairly routine.

Our test car came with the standard exhaust system that helps the engine produce a claimed 3.5hp. Whatever the number, I found the engine exceptionally strong and also controllable. Power delivery is more subtle at lower speeds, such as when coming out of tight corners, and that helps to keep the rear tires stuck to the ground. When the car picks up speed again, however, the engine gets "on the pipe" and makes the real power that gets the Brave 2 up to a very impressive mph on the straights. The stock engine is powerful enough to get the wheels spinning with less than ideal tracks—with the lesser of the two tuned pipes. I imagine that when using the optional pipe, you need a more measured, more deliberate throttle application.

With the optional front disc brakes, cornering is commendable. The brakes' extra stopping power and consequent increase in controllability makes them well worth the increased expense. Stopping the car is easy enough with just the standard rear brake, but but it takes much longer and control is less predictable.

DISLIKES

- Radio tray accepts only large-scale servos—no dual-standard-size option.
- Instructions, though good, leave a lot to the imagination.

SOURCE GUIDE

BLACKHAWK R/C CORP. (503) 816-8343; narcobruce@aol.com.

FUTABA (800) 637-7660; futaba-rc.com.

HITEC RCD INC. (858) 748-6948; hitecred.com.



HEAD 1

TEAM LOSI XXXS

by Greg Vogel, Kevin Hetmanski & Peter Vieira



Battle of America's BEST

There are lots of great RC cars in the world, but America cranks out some of the best, courtesy of Team Associated and Team Losi. Almost as quickly as Associated's first RC10 buggy touched its rock-hard 1980s tires to the dirt, Team Losi was right there with the JRX-2 to battle for RC's top honors. Nearly 20 years later, Associated versus Losi has become RC's eternal grudge match. The two brands duke it out in nearly every category of RC competition (exceptions: no nitro touring or pan cars



HEAD-TO-HEAD

ASSOCIATED TC3 TEAM

for Team Losi; no 4WD buggies for Associated), but electric touring may be where the rivalry runs deepest. Associated's TC3 and Team Losi's Triple-XS both broke away from the 2-belt standard with their unique drive trains (shaft drive for the TC3, and a serpentine mono-belt for the Triple-XS), and both cars represent unique visions of what it takes to be the best competition electric touring car. We set out to find which one really is better, and not just in terms of pure performance. For this head-to-head comparison test, everything counts—from the instruction manuals and the cars' ease of assembly to their fastest laps on the track and the cost of the kits.



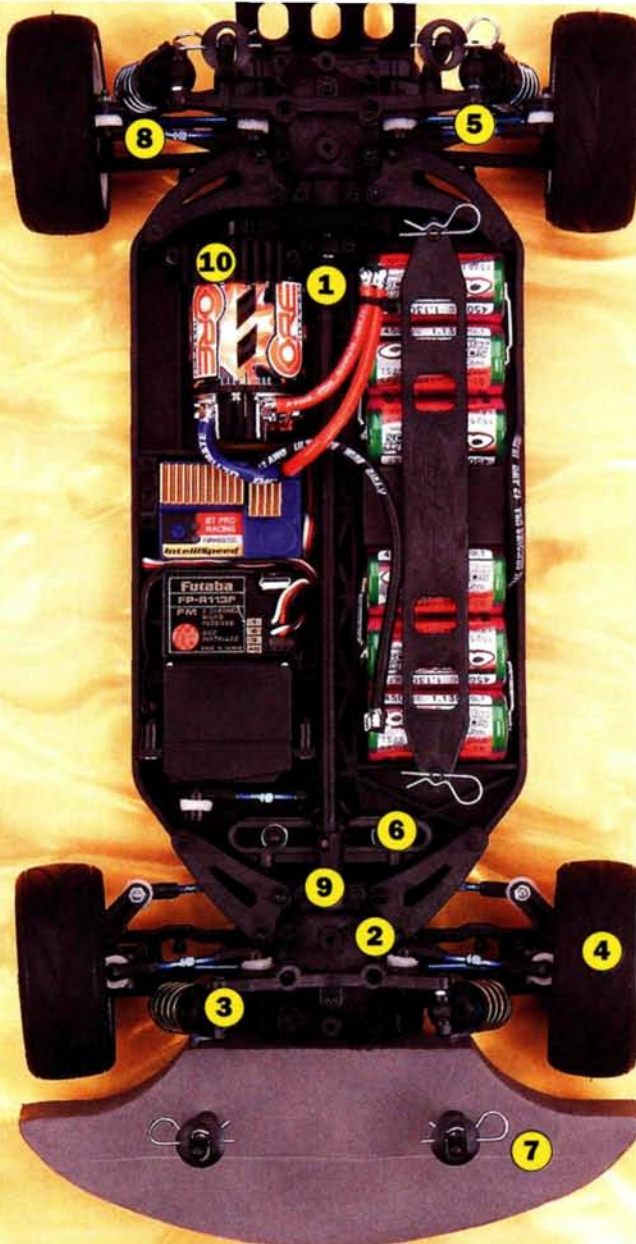
Photos by Pete Hall

Associated TC3 Team

Associated probably could have joined the scene sooner if its engineers had gone for just another 2-belt car. Instead, Associated spent a lot of time developing the TC3's now famous (or for you Predator fans, infamous) shaft-drive system. Before the TC3, no other serious competition touring car since Tamiya's original TA02 had made a significant impact on the racing scene. The TC3 debuted to instant acclaim, particularly in stock-racing circles, where its super-efficient shaft-drive system ensured that every precious watt of stock-motor power made it to the tires.

features

1. Floating shaft drive
2. Stealth ball differentials
3. Blue-anodized aluminum VCS shocks
4. Pro-Line Axis wheels with V-Rage tires and inserts
5. Genuine MIP CVD axles
6. "True Ackerman" sliding-rack-steering system
7. Foam bumper
8. Titanium turnbuckles
9. Rubber- and Teflon-sealed bearings
10. Integrated motor heat sink



1. Associated spent a lot of time on the innovative sliding-rack-steering system's geometry so the TC3 would have the correct Ackerman for turns of any radius. Titanium turnbuckles are standard.

2. Hub spacers permit subtle wheel-base adjustments, and large droop screws with ground-contact points make it easy to set ride height independently of spring preload.

3. Capped suspension arms and combined kingpin/ball studs equip the TC3's front end. Do ya think the bumper's thick enough?

4. Thanks to shaft drive and well-sealed diff cases, the TC3's differentials require virtually no maintenance.

manual labor

■ **THE MANUAL.** Fully rendered computer drawings supported by text and full-size parts legends make it easy to follow the TC3's manual during assembly. Even the setup section at the back of the book is illustrated, and this makes it especially good for novice tuners. A gear-ratio chart with motor wind suggestions and a blank setup sheet are included.

■ **INCLUDED TOOLS.** Along with the usual "L" wrenches to fit the kit's hex fasteners, Associated includes three molded wrenches to fit the kit's turnbuckles, nuts, shock caps and shock bodies. A molded droop gauge is also included.

■ **ON THE BENCH.** The TC3 goes together fairly well, if not quickly; the TC3 simply has more parts than the Triple-XS. During the buildup, we found ourselves removing extra flashing from parts like the suspension arms and diff cases. Also, make certain not to overtighten screws. If you have a strong hand, you may strip out a few screw holes. Once built, the TC3 is very easy to live with; it requires much less attention than a dual-belt car with an open drive train. Since the diffs are fully enclosed, you can put off rebuilding them for quite a while. When they do need to come out, six screws allow the tops of the front and rear gearboxes to be lifted off for access. The shock towers will come along for the ride, making the job slightly less "clean," but it doesn't add any difficulty.

at the track

We began testing on a cool morning on a board-and-dot track we had set up on an unprepared parking lot. With its cold tires on unswept pavement, the TC3 was far from hooked up, but the lack of traction let its balance shine. It was impossible to avoid going wide in the turns, but it never spun out. The TC3 slid with utter predictability and responded well to throttle and steering inputs for attitude adjustment. As the parking lot warmed up and a groove began to form, the TC3 found more traction and stuck better. As traction improved, so did steering, and we found ourselves driving more aggressively. With its responsive shaft drive, the Associated TC3 had excellent braking control and right-now acceleration for the straights; stomping on the binders just before the tightest corners and mashing the throttle on the way out did little to upset the chassis. Transitional handling was also good, with progressive oversteer through the chicanes as we whipped the car from left to right and back. In later slalom testing, the TC3 was able to hustle around five or six cones at full bore before the rear end broke free. With no changes to the box-stock setup, the TC3 felt ready for pavement battle.

TEAM LOSI XXXS



The sedan world is full of belt-driven cars, but none of them are like the Triple-XS. Where the rest of the belt-drive cars use a pair of belts to spin the differentials, the Triple-XS uses just one low-friction belt that wraps around the spur-gear pulley, an adjustable tension roller and large-diameter ball differentials. You touring car know-it-alls are probably saying "The Kyosho KX-One is single-belt, too!", and you're right, but the Triple-XS has another distinguishing feature that sets it apart from other belt cars: its entire drive train is fully enclosed. This makes the belt system immune to carpet crud and outdoor debris, yet the Triple-XS is still easy to work on, thanks to front and rear diff-access hatches and a removable spur-gear cover.

features

1. Fully enclosed single-belt drive train
2. Large-diameter ball-diff pulleys
3. "One-piece" chassis
4. Easy-access diff hatches
5. Accepts standard touring wheels and Losi wheels
6. Adjustable down-travel
7. Hard-anodized shock bodies
8. Steel turnbuckles
9. Genuine MIP CVD axles
10. Foam bumper
11. Team Losi yellow-compound treaded tires with molded strip inserts

1. There's nothing new about dual-bellcrank steering, but the Triple-XS cranks have very distinctive geometry. The bellcranks turn on plastic bushings.

2. The hinge pins still have slots for E-clips, but you won't find any on the car; all of the Triple-XS hinge pins are either captured by their mounts or pinched in place by setscrews. Note the mounting block for the inboard hinge pins; it can be flipped to adjust rear anti-squat.

3. Combined kingpin/ball studs, capped suspension arms and well-braced steering knuckles give the Triple-XS a rugged front end. Steel turnbuckles are standard.

4. Differential access is very simple with the Triple-XS, not that you'll need to get in there often.

manual labor

THE MANUAL. Like all current Losi manuals, the Triple-XS book uses line drawings to illustrate each step, with plenty of text to support the pictures and full-size hardware legends to help you grab the correct nuts and bolts. For those steps that rely on proper front/rear and left/right orientation, an image of a driver's helmet is used to indicate the direction the car is facing. A detailed tuning section closes the manual but is not supported by illustrations. A chart of suggested gear ratios matched to motor winds is included, along with a blank setup sheet.

INCLUDED TOOLS. The Triple-XS includes the expected set of "L" hex wrenches and a turnbuckle wrench. A molded droop gauge is an added bonus.

ON THE BENCH. All Losi kits are carefully packaged, so each parts bag contains all the items required for the stage of assembly; you won't find any steps asking you to grab screws from bag "H," bearings from bag "F" and hinge pins from bag "B." This, along with the clearly written manual and very good parts fit, makes the Triple-XS a quick build. Just be sure to use the included tapping screw to thread the hard plastic parts, or you'll find it difficult to install the kit's hex hardware. It's also an easy car to live with after assembly; the bottom-loaded shocks make for speedy oil changes, and the differentials can be removed without disturbing the suspension parts. You shouldn't need to get to the diffs often, though, since the belt system is fully enclosed. Best of all, the Triple-XS is free of E-clips; all the hinge pins are either captured by their mounts or secured by setscrews.

at the track

We tested the cars alongside each other, so the Triple-XS had to cope with the same cold, dusty conditions as the TC3. In this environment (and with the box-stock setup), the Losi car was more of a handful. It was definitely looser, and though it was controllable, a deft hand was required at the wheel to prevent it from looping in tight turns and pointing itself at the boards instead of down the straights. Once aimed, it had no problem putting the power down, and it launched down the straights with powerful acceleration and tracked like a monorail. It actually seemed quicker than the TC3, but that impression was probably the result of its having a nearly noiseless belt drive; in side-by-side drag-testing, the identically powered cars were locked in a dead heat from the green light to the finish line. As traction improved, the Triple-XS became easier to drive, and we found ourselves pushing it less hard to get the same amount of steering. You could say that "aggression" is built into the Losi, since it tended to oversteer. This made it easier to drive it fast, but if we pushed it too hard, there was less of a "buffer zone." This became apparent in the slalom course on which the Triple-XS spun out one cone before the TC3.

test setup

■ DURATRAX INTELLISPEED 8T PRO RACING ESC

The easiest way to describe the top-of-the-line IntelliSpeed ESC is to call it DuraTrax's version of the original Novak Cyclone. In addition to a similarly configured case, the 8T Pro has external solder posts and a full range of programmable functions—everything from current limiting, minimum and maximum brake, quick start/turbo modes to operating frequency can be independently adjusted via the setup button. If you're not into all that programming, you can select one of the 8T's four factory setups that are customized for 1/2 on-road, stock touring car, off-road and mod touring car.

■ TAKE-OFF SPEC TIRES

With their turbine-like 15-spoke wheels and high-quality factory bonding, Take-Off's assembled touring car wheels and tires were an easy way to hook up the TC3 and Triple-XS with equal traction. Take-Off offers the tires in a variety of compounds and sells the tires in sets of four, and they are rapidly becoming popular choices for spec-class control rubber. Most recently, Take-Off tires were the treads of choice at the Reedy Touring Car champs.

■ FUTABA 3PDF TRANSMITTER

Futaba's second-tier computer radio is a perennial favorite; it provided us with all the control and ride-enhancing adjustments we could ask for.

■ FUTABA S9450 DIGITAL SERVO

The S9450 was Futaba's first digital servo, and it's still a top performer. With 111 oz.-in. of torque and a super-quick 0.10-second transit time, the test cars had more than enough turning power and right-now steering response.

■ PROTOFORM DODGE STRATUS

Only the TC3 wore a Protoform shell; the Triple-XS includes Losi's homegrown Stratus-style bodywork.

■ TEAM ORION GP3300 V-MAX TEAM PACKS

The Orion guys wasted no time getting the latest GP3300 super-cells into their matchers. Like all Orion cells, the GP3300s first get the V-Max voltage-increasing process, then are computer-matched using "Race Discharge Simulation." The cells with the best capacity, voltage and resistance figures go into "Team" packs.

■ TEAM ORION 11-DOUBLE CORE HAND-WOUND MOTORS

The Core motors have all of Orion's usual highlights, including an Ultra Flow can and endbell (with built-in capacitors and brush dampers), pattern winding and epoxy balancing. New Core features include a high-torque, thick-web armature, Pro springs and 1030 competition brushes; fast stuff.

■ ROBINSON RACING PRODUCTS PRO PINIONS

Like most other competition electric touring cars, neither the Triple-XS nor the TC3 includes a pinion gear. We installed Robinson's hard-anodized aluminum Pro pinions to complete the cars, and we geared both cars with identical rollouts.

specifications

	ASSOCIATED TC3 TEAM	TEAM LOSI TRIPLE-XS
Weight, as tested	54.6 oz. (1,548g)	56.7 oz. (1,607g)
Wheelbase	259 to 261mm	256mm
Width F/R	184mm	186/190mm
Caster	0°*	0°*
Camber links	Titanium turnbuckle	Steel turnbuckle
Steering tie rods	Titanium turnbuckle	Steel turnbuckle
Kick-up	2°	0/2/4° (adjustable)
Anti-squat	2°	0/2/4° (adjustable)
Rear toe	3°	2°
Droop	Arm screws	Arm screws
Front camber link positions (inside/outside)	4/1	4/1
Rear camber link positions (inside/outside)	4/2	4/2
Front shock positions (upper/lower)	3/1	4/1
Rear shock positions (upper/lower)	3/1	4/2
Ackerman positions (inside/outside)	1/1	1/1
Shocks	Blue-anodized aluminum	Hard-anodized aluminum
Transmission ratio	2.5:1	1.83:1
Included spur gear	72	88
Drive axles	MIP CVD	MIP CVD
Ball bearings	Rubber/Teflon sealed	Metal shielded
Wheels	Pro-Line V-Rage S2	Team Losi treaded
Inserts	Pro-Line foam	Team Losi shaped strip
Body	Not included	Team Losi Stratus-Fear
Price (varies with dealer)	\$220	\$230
*Optional parts available to alter setting		

WHO WINS?

As tested in their completely stock, built-by-the-book form, the TC3 Team and Triple-XS are both ready to race. On our track, with modified power, the TC3 was easier for the less-skilled driver to get around the track. It was more predictable and less prone to a complete loop-out if we totally blew a turn. Drivers with quicker reflexes will find the Triple-XS easier to get up to race pace; it has a little more oversteer and rotates more quickly in the turns with less input at the wheel. Though differing driving styles were required to get the cars through the course at their fastest, the machines had comparable lap times. For the record, the Triple-XS turned the single fastest lap (a 19.98, according to our Team Orion Pro LCS lap counter), which the TC3 backed up with a 20. But not everyone was quickest with the Losi; Peter was fastest with the TC3, Greg was fastest with the Losi, and Kevin netted the same average lap times with both cars, though he found the TC3 better for his driving style. So, performance-wise, it's a stand-off, especially when you consider that these fully tunable race cars can be tailored to your driving style. We tested the cars with the manual-suggesting starting setups.

That leaves features to consider, and even that's a tough call; both cars are equally adjustable, and though the TC3 Team kit includes titanium turnbuckles, it does not include a body. On the other hand, the Triple-XS has steel turnbuckles, but it does include a race-worthy Stratus-style shell.

And don't expect cost to be the deciding factor; the price difference is only \$10 (actual prices vary with dealer). Basically, choosing between these cars comes down to brand loyalty (you know who you are) or the "X-factor" of local track popularity. If you aren't married to one brand or the other, go with the one that is best represented on your track and your hobby shop's parts inventory. Either way, America is the big winner in this shootout.

SOURCE GUIDE

DURATRAX; distributed by Great Planes Model Distributors; duratrax.com.

FUTABA; distributed by Hobbico/Great Planes Model Distributors; futaba-rc.com.

GREAT PLANES MODEL DISTRIBUTORS (800) 682-8948; greatplanes.com; hobbico.com.

PROTOFORM INC.; distributed by Pro-Line (909) 849-9781; pro-lineracing.com.

ROBINSON RACING PRODUCTS (209) 966-2465; robinsonracing.com.

TAKE OFF; distributed by Schumacher USA (813) 889-9691; racing-cars.com.

TEAM ASSOCIATED (714) 850-9342; teamassociated.com; rc10.com.

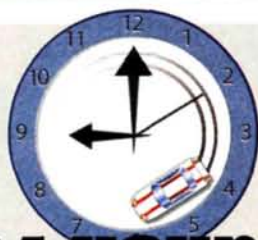
TEAM LOSI; distributed by Horizon Hobby Inc. (800) 338-4639; teamlosi.com; horizon-hobby.com.

TEAM ORION INC. (714) 694-2812; team-orion.com.

SPONSORED BY

KYOSHO
THE FINEST RADIO CONTROL MODELS

BY GREG VOGEL & GEORGE M. GONZALEZ



24 HOURS OF LRP

LRP will sponsor LRP's first "24 Hours of Eppelheim," to be held November 30 through December 1, 2002, in Eppelheim, Germany. The 2-day event will start on Saturday with open practice, and one round of qualifying will determine the grid order. After the starting tone sounds, the race runs nonstop until the same time the next day! Each team must organize its own driving schedule to determine when the transmitter will be handed off to the next teammate. No doubt at least one ironman driver will try to complete the race on his own. Have you ever dreamed that you were racing an RC car and then awakened to find a transmitter in your hand? It just might happen at this event. For more information on this unique touring-car race, log on to lrp-electronic.de.

SITE SEEING



CARDOMAIN.COM

If you're into scale RC, you've got to check out this site! It's one of the largest online communities of home pages designed by car and truck enthusiasts from around the world. Cardomain.com has everything from sport compacts to hot-rods, lowriders and 4x4s. You'll find thousands of pictures, articles, links and a really cool bulletin board. The site is a great source of paint designs for your RC (and full-scale) car and ideas for your next concours project. If you're a certifiable car nut, you'll definitely want to bookmark this page.

BOARD WALK

FROM THE
RADIOCONTROLZONE
.COM BULLETIN BOARD

Cool things to do with a rotary tool

BULLET 87: I just got a Dremel. Besides basic household jobs, how can I use it for RC purposes?

RELLINK/C: I use it for a lot of things; it's good for sanding, grinding, polishing and drilling. It also makes a mess on my workbench.

RCDEUDE03: I couldn't live without my Dremel! I use it for grinding molded parts to make them lighter, drilling new shock-mounting holes on shock towers, custom-fitting parts that are not designed for my car but will work with a little grinding and hand fitting, removing screws that have snapped and lost their heads, etc. The sky's the limit with this tool!

Real off-road surfaces or blue groove; which do you prefer?

XXXMIKE: I love blue-groove tracks. Your car always stays clean, and there's traction to spare.

SURFER: Real off-road, because your car shouldn't be clean after a race, and everyone has to fight for traction. There aren't supposed to be preferred lines in off-road racing; that's why it's called off-road.

SPEEDYDAVE: I prefer something in between. I like tracks that are hard packed but with a layer of dust to make things challenging. Tire wear isn't as much an issue on tracks like this.

BE HEARD!
LOG ON AT WWW.RADIOCONTROLZONE.COM

CASTLE HOBBIES LAUNCHES MINI AND MICRO RACING

Castle Hobbies of San Jose, CA, has built one of the most impressive mini and micro RC tracks that we've ever seen. The modular track system designed by racewayrc.com is erected on a raised platform and features banked corners, chicanes, low-height corner markers, bridges, overpasses and a Le Mans-style starting grid. The track is open for practice and racing. Six racing classes are offered: Sedan Stock, Sedan Pro, Formula 1 Stock, Formula 1 Pro, Micro Stock and Micro Pro. Give Castle Hobbies a call at (408) 377-3771, or

log onto castlehobbies.com for more information. The staff there plans to host an 8-race Grand Prix series with prizes awarded to the top racers in each class.

On a similar note, Great Planes and Kyosho will implement a Mini-Z racing series and Mini-Z Nationals. Several regional races will funnel down to the national championship that will take place at Castle Hobbies on a yet to be determined date in 2003. We'll keep you posted as more information on this hot new racing series becomes available.



TRAXXAS' NEW CRIB

Traxxas has outgrown its old facility in Dallas, so the crew packed up the ranch and moved it to Plano, TX, where the grass is greener and everyone owns a T-Maxx. The new facility is nearly twice the size of the old one, which only makes sense; everything's bigger in Texas. Traxxas' address has changed, but you can still get technical support by calling (888) TRAXXAS, by logging on to traxxas.com, or by emailing support@traxxas.com.

RUMOR MILL

COMPETITION FOR THE MICRO RS4. Our industry spies have informed us that a major RC manufacturer is in the process of designing an 1/18-scale, 4WD touring chassis to compete with the HPI Micro RS4. We can't tell you much more about this project except that the car will likely feature a fully independent front and rear suspension and will be compatible with bodies designed for the HPI Micro RS4.

SPEED SHOP



TRINITY

Brush-hood-alignment tool

Now you can align your laydown, standup and Trinity P94 brush hoods quickly and accurately with this easy-to-use tool. Aligning your motor's brush hoods is a sure-fire way to ensure maximum motor efficiency, which paves the way for increased power. Professional racers and drivers who are in the know routinely align their brush hoods every time they rebuild their motors. You should, too, if you want to keep up with the big dogs. The Trinity brush-alignment tool features smooth, strong, stainless-steel alignment guides and an adjustable knurled grip for improved leverage. Brush-hood-alignment tool—RC2082; \$22. Trinity Products Inc. (732) 635-1600; teamtrinity.com.

TEAM WALBERN

Veri-track hub set

This hub system for 1/10-scale on-road and oval cars allows you to fine-tune your car's steering characteristics by adjusting the rear track width. Precisely machined spacers that slide over each side of the rear axle can be added or removed to adjust rear track width in 0.050-inch increments. The spacers come in 0.05-, 0.1- and 0.2-inch sizes and are included with the hub set. The set includes left and right hubs and the adjustment spacers. The pieces are nicely machined and have been blue-anodized for a cool look. The left-side hub features a clamping mechanism for hassle-free wheel removal. TC Veri-Track hub set—\$65.

Team Walbern (860) 667-7627; teamwalbern.com.



TEAM ORION

Bones silver battery bars

These Team Orion Bones battery bars are coated silver for the best possible conductivity. The bars have been prebent to fit above the battery tabs and prevent them from shorting out. The unique dogbone shape actually makes the battery bars easier to solder to the battery tabs. The battery bars are sold in packages of eight—enough bars to build a couple of 6-cell battery packs.

Bones silver bars—40114; \$4.25. Team Orion Inc. (714) 694-2812; team-orion.com.

TM RACING Mach-2 and Black Max NASCAR wheels & tires

Tenth-scale oval racers are sure to want a set of TM Racing's Black Max NASCAR wheels because they look scale and are extremely rigid. According to TM Racing, the Black Max wheels are molded of super-tough nylon to reduce wheel flex, and they're also very light. The new Mach-2 1/12-scale wheels are made of the same nylon composite, which means that these wheels are rigid and light, just like the Black Max wheels. The Mach-2 wheels are designed to fit all 1/12-scale vehicles and are available in 2- and 3-bolt patterns.

Mach-2 mounted and trued tires—various item nos., \$12.95 to \$19.95 (fronts), \$14.95 to \$21.95 (rears).

Black Max mounted and trued tires—various item nos., \$14.95 to \$23 (fronts), \$17.95 to \$27.95 (rears).

TM Racing distributed by Schumacher USA (813) 889-9691; racing-cars.com.



SPEED SHOP



RPM Receiver box for RC10GT

Fuel, dirt, moisture and vibration can ruin your vehicle's receiver if it is left unprotected. Consider RPM's new molded receiver box a must-have item for the Team Associated RC10GT, since the truck's receiver is not protected from the elements. The RPM receiver box can be installed on the GT chassis in minutes and includes the fasteners and instructions needed to do the job. Although designed for the GT, the RPM receiver box can be

adapted to fit other vehicles by drilling mounting holes in the chassis. The top of the receiver box is attached with screws for extra security, and an antenna mount is built into the side of the base. According to RPM, the receiver box is guaranteed to withstand the toughest crashes, including side impacts, and it's available in black and blue.

GT receiver box—70052 (black), 70055 (blue); \$9.95.

RPM (909) 393-0366; rpmrcproducts.com.

TRINITY Chassis droop and ride-height gauge

Trinity's droop and ride-height gauge is made of machined aluminum and anodized black for style. The Trinity droop gauge is unique because it has stepped gauges on both sides of the tool. Use one side to measure arm droop on 1/10-scale sedans and the other for 1/8-scale cars.

Droop/ride-height gauge—2083; \$25.99.

Trinity Products Inc. (732) 635-1600; teamtrinity.com.



TRACK THREADS



Front



Back

MaxxTraxx wear

If you own a Traxxas Maxx truck, chances are good that you're a regular visitor to maxxtraxx.com—one of the largest online communities of T-Maxx owners on the world-wide web. Now you can let everyone know that you're a proud T-Maxx owner and a maxxtraxx.com visitor by ordering your very own maxxtraxx.com T-shirt or sweatshirt. The T-shirts are available in black and gray, short sleeved or long and in various sizes. The hooded sweatshirt only comes in black with white print, but several sizes are available. Log on to maxxtraxx.com and check out the available styles, colors, sizes and prices.

LAST LAP

Which pro driver would you like to see racing full-scale cars, and which types of cars would they race? Matt Francis in a Desert Truck; Masami in an F1 car? Tell us who, what and why.

How about Richard Saxton racing NASCAR for the sheer sake of seeing what he could do on the asphalt? I can see him now, power sliding through turn 4 at Bristol.

Brandon Cook

Put Matt Francis in a monster truck! Now, that would be a thrill to watch, don't you think? He could roll over his competition!

Robbie Craver

I hope I'm not dating myself with this response, but I'd like to see

Cliff Lett race a supersonic jet car like the Spirit of America. If he could make a TC3 go 90mph, I'm sure he could exceed Mach 1 in some kind of land missile.

Jeff Pierce

I think that Brian Kinwald and Matt Francis should both have a go at full-scale stadium-truck racing. Doesn't Team Losi sponsor a full-scale stadium truck? I thought I saw it in the mag once. Anyway, I think we'd all be surprised at how competitive they would be in full-scale racing.

Many of the skills they bring to RC racing could be applied to racing the real thing.

Donald Hassenblum

I don't know about full-scale cars, but I wouldn't mind seeing Masami Hirose, Joel Johnson, Chris Tossolini, Barry Baker, David Jun, Brian Kinwald, Mark Pavidis, Matt Francis, Atsushi Hara and Billy Easton battle it out in a 10-car main event with go-carts. Now that would be a spectacle I wouldn't want to miss for the world.

Matt Sheriff

NEXT MONTH'S QUESTION

In an effort to keep the racing cleaner and closer, one-way pulleys and one-way diffs were not allowed at the 2002 Reedy TC Race of Champions. Should a similar rule be adopted for all national and world-championship TC events?

Respond by clicking "Last Lap" at rccaraction.com.

UNDER THE HOOD

Paul Coleman's

OFNA Dominator (Prototype version)



RACE GEAR

Radio Airtronics M8
Receiver Airtronics
Onboard battery OFNA 1100
NiMH
Steering servo Airtronics 94358
Throttle servo Airtronics 94358
Engine OFNA/Pico Comp 01 BP

Clutch Stock 3-shoe
Fuel O'Donnell 30 percent
Pipe OFNA off-road 1-piece pipe
Tires Pro-Line Bow Ties
Tire inserts Trinity Da-Bomb
Body Pro-Line Chevy Silverado
Pinion and spur 13/61

SETUP

	Front	Rear
Camber	1 degree negative	1 degree negative
Toe-in	1 degree in	3 degrees in
Shock oil	40WT	35WT
Shock piston	2-hole*	2-hole*
Shock springs	9.5 Blue (soft) springs	9.5 Blue springs
Ride height	Arms level	Dogbones level
Upper shock mount	Inner hole**	Inner hole**
Lower shock mount	Outer hole	Outer hole
Swaybar	None	Standard

*Paul enlarged the piston-valve holes with a 1.3mm drill bit.

**Paul drilled new inner/lower upper shock-mounting holes in the front and rear shock towers to lean the shocks inward and provide more progressive damping.

FACTORY & AFTERMARKET OPTIONS

- Prototype OFNA Torsen center differential filled with 30,000WT silicone diff fluid
- 9.5 threaded-body shocks
- Monster Pirate CNC-machined front steering knuckles
- OFNA Graphite radio tray
- 8mm rear CV joint universal axles
- Rear brake installation kit
- Lunsford titanium tie rods

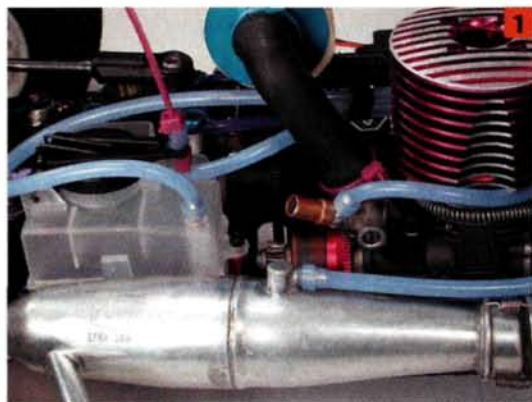
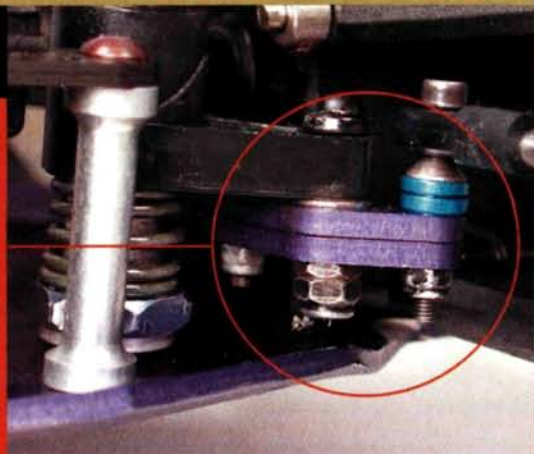
MODIFICATIONS

- The front upper arms are attached to the outer holes on the optional steering knuckles to provide less camber rise. The steering knuckles are ground at an angle to provide more down-travel.
- 8.5mm spacers are installed on top of the steering knuckles, and 7.5mm spacers on top of the steering drag link help reduce bump-steer.
- Paul installed aluminum fuel-tank posts for extra security. He used the stock mounting screws and rubber bushings as well.



FACTORY DRIVER HOT MOD

Check out the aluminum steering drag links. Two drag links are sandwiched together for extra strength. The spacers under the ball joint help reduce bump-steer. Paul also doubled the center diff plate. An ounce of prevention goes a long way.



1. Paul replaced the center spool and slipper clutch with a prototype Torsen differential. The spring-coupled pipe is an OFNA item, and all the fuel and pressure lines have an additional band of tubing over the fittings for extra security.



2. Paul's truck is actually an original prototype. He's happy with the way his truck handles, and he doesn't want to have to repeat all of his modifications on a production truck. Paul prefers not to use the stock molded bumpers because they add unnecessary weight to the truck. You'll notice that the upper shocks are mounted on new, inward-facing shock-mounting holes on the shock tower. Yup; those are 9.5 threaded-body shocks.



3. The jack exiting the radio box is for quick-charging the onboard battery pack—no need to open the radio box before a race.



4. Paul ground the upper edges of the steering knuckles at an angle to allow the suspension arms to pivot without binding. The upper arm is usually installed in the inner holes on the steering knuckles, but Paul mounted the arms in the outer holes to reduce camber rise.

5 QUESTIONS

DRIVER: Paul Coleman

AGE: 31

LAST BIG WIN:

Pro-Line Maxx Challenge

SPONSORS: OFNA,

O'Donnell, Airtronics and Nitro House

WHEN I'M NOT RACING, I: spend time

with my girlfriend Debra and go to baseball games with my Mugen friends.



RC CAR ACTION: I hear you just came back from competing at the Hyper 7 Cup in Taiwan. How did you do at the race?

PAUL COLEMAN: Not so good. I qualified in second right behind Yuichi Kanai, who was a special guest at the event. During the Main, Kanai blew out his center Torsen and I blew a rear diff, so both of us got put out early in the race.

RCCA: That's too bad. What was it like racing in Taiwan?

PC: Oh, man, it was so hot over there. I'm from Texas, so I'm used to the heat, but their weather was absolutely ridiculous. It was so humid that I had a tough time working on my car. It's hard to hold a wrench when your hands won't stop sweating! The track was huge; I mean, it was nearly twice the size of the Worlds track that was set up in Vegas. There were big cement jumps everywhere that were really rough on our cars. Overall, though, it was an interesting experience—to say the least.

RCCA: Tell me about your baseball roots. Which team did you play for, and when?

PC: I was drafted right out of high school. I was the number-one draft pick for the St. Louis Cardinals back in '89. I was actually drafted ahead of Frank Thomas, John Olerud and Chuck Knoblauch, but unfortunately, I blew out my knee and then my elbow in the Triple A league before I ever really got my shot. I was on the Cardinals' roster for two years in a row under manager Joe Torre, which was great, but I only got to play when a regular big-leaguer was hurt.

RCCA: How did you make the transition from baseball to working at OFNA?

PC: I've always dug RC cars, ever since I saw Ozzie Smith—the Cardinals' Hall of Fame shortstop—piloting an electric off-road car around the baseball field during spring training. I asked him what it was, and he replied "It's a toy RC car." Right then, I knew I had to get one, so I went to a hobby shop, walked up to the clerk and said, "I want an electric off-road RC car with the fastest motor you've got!" I've been hooked ever since! When I was thinking about moving to California, I thought it would be great to work in the RC industry. I mentioned to Tim Long and Kris Moore of Mugen that I would need a job in California, and they said, "Come on down; we're sure we can find something for you," so I packed up my stuff and moved. Kris and Tim hooked me up with Tim Bump, who introduced me to Dave Morales, who owns OFNA. The rest is history, I guess.

RCCA: How do you like your job at OFNA?

PC: This is a really good place to work. Let me tell you, despite all the RC companies out here, OFNA is climbing to the top. It's a very relaxed atmosphere here, and that suits me perfectly. I look forward to coming into work; Dave makes it that way. We all have a really good time around here, which

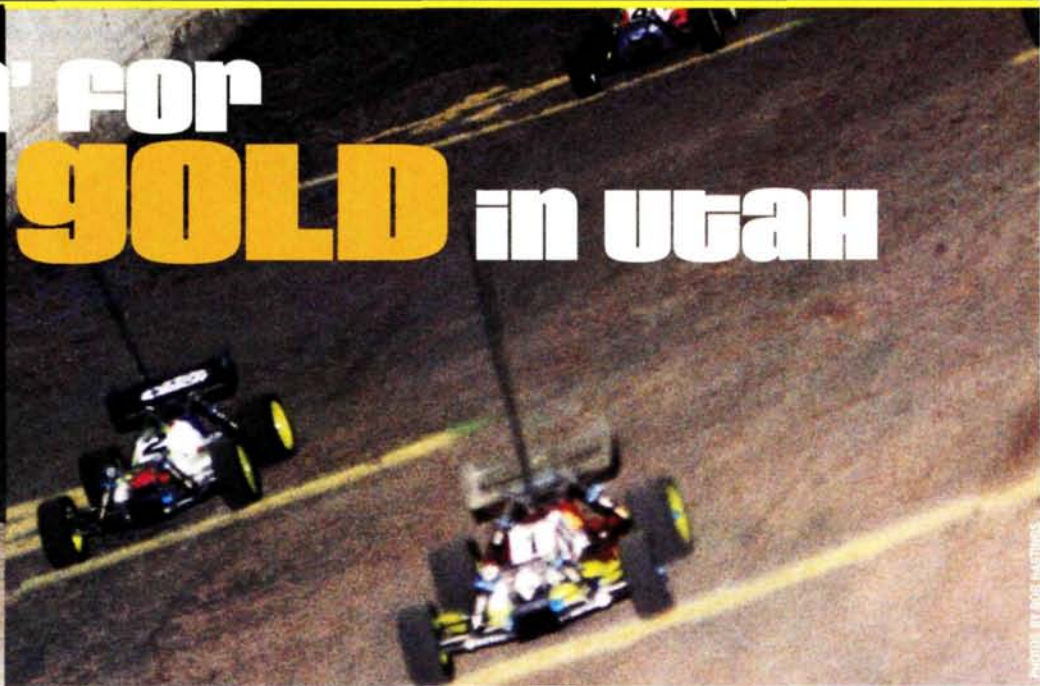
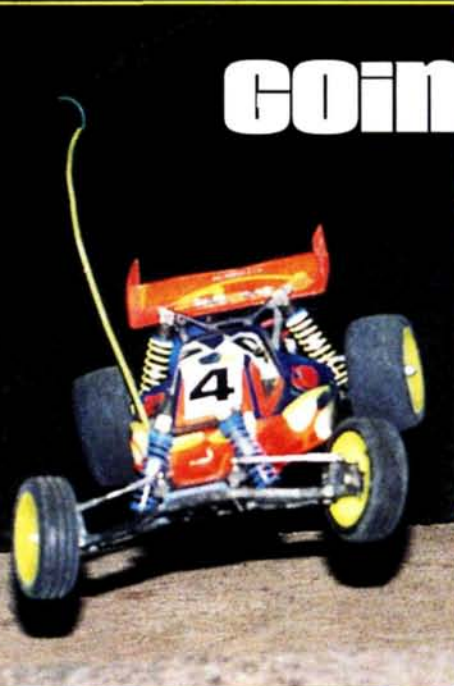
seriously makes it a lot easier to get along with everyone.

ROAR 1/10-SCALE

SPONSORED BY TEAM LOSI, TEAM ORIGN, RC CAR ACT

OFF-ROAD STO

GOIN' FOR GOLD in UTAH



SLICK TRICK



The IRCR's well-prepped track delivered gobs of grip, and racers took advantage of the gummy surface. At first, the drivers were satisfied with nipping the Losi Taper Pins to suit the increasingly sticky track conditions. As surface grip increased still further, some drivers covertly shaved their pins away; those who could maintain the racing groove found that the slicks were a clear advantage. Soon the Dremels were everywhere; the smoking chorus of sanding drums made the Intermountain facility look and smell as if John Force had just staged his Funny Car inside. I've never witnessed anyone grind more tires during a single event than Matt Francis; by the end of qualifying, he had more rubber on him than the Michelin man in a wetsuit.



AIRTRONICS, NOVAK, LUNSFORD, HITEC, RACER'S EDGE, GIZMOS AND THE INTERMOUNTAIN RC RACEWAY

CK Nationals

By Bob Hastings

The greatest technological advances in motor sports are the result of one thing—competition; it's the catalyst that motivates manufacturers to produce better, stronger and faster cars. But what is it that advances competition? It's racing at the grass-roots level.

The ROAR Stock Nationals are a showcase of talent for the current leaders at local tracks and the RC pro's of tomorrow. Just outside Salt Lake City, UT, in the shadow of the recent Winter Olympic Games, off-road racers from around the country gathered for their own quest for the gold. No snow to be found here, though; the 107 degrees plus temperature was the highest in Utah's history, but still hotter was the competition inside the Intermountain RC Raceway.

Set against the steep hills that overlook Salt Lake City is the Intermountain RC Raceway in Magna, UT. Extensive improvements have turned it into a top-notch facility with a well-groomed racetrack, 150 well-lit and fully powered pit stations as well as a well-stocked shop. Nats contestants were able to sign up early online and reserve their numbered pit spaces. Representing ROAR was Mike Mayberry of Hitec RCD. Famed factory pilots Matt Francis (Team Losi) and Billy Easton (Team Associated) hung up their transmitters for the weekend and assisted those drivers who needed a hand with their cars. In addition to providing technical knowledge, these two frequently offered encouragement and moral support that meant as much as their expert advice. The weekend competition's handouts included a set of Team Losi tires and an Orion Core stock motor. The action began on Friday at 8 a.m. with a 3-hour practice session followed by the first round of qualifying. Many incumbent champs were there to spice it up, but early lap times didn't show a clear favorite in any division; they simply set the stage for some really great racing.





2WD BUGGY

As the tone fired and the Mains got under way, TQ Mike Truhe set the pace, with Cliff Nicholson and Brian Westerman trailing. An early tangle with traffic "turtled" Westerman's buggy, and Christian Toic slid into third to really put the pressure on Cliff. With less than a minute to go, Truhe flipped, and Nicholson shot past. A late-race charge followed by a tangle of the two lead cars reshuffled the positions, and Truhe won. He repeated his victory in the second "A"; Eric Clark was second. Westerman struggled and fell to an uncharacteristic ninth place but was back in usual form and won in the third. All low scores were removed, and it was Truhe first, then Nicholson and Toic, third overall.

4WD BUGGY

The fourwheelers set a blistering pace in the final; a tightly grouped pack led by Cliff Nicholson raced cleanly through the opening. An early bobble left Nicholson

on his roof and allowed Mike Truhe to dart by. The positions were swapped back and forth in some of the weekend's best racing, and when it was over, Truhe was out front followed by Nicholson and Jonathan



Noone. In the second A-main, Nicholson was back out front early, ninth-place qualifier Noone gave heavy pressure again, followed by Truhe and Frank Riley. In a bizarre bit of racing, Noone ended ahead of Brian Westerman's car and stayed there for most of the backstretch. In round 2, Nicholson had a strong victory, and Truhe and Westerman finished two and three. As the group entered round 3, Truhe edged Nicholson for the overall win.



TRUCK

The truck guys' picture-perfect launch seemed to set the example for clean racing, but that illusion quickly evaporated when Wayne Ashmore, Brian Westerman, Chris Toic and Chris Marsh all got together. Led by Colorado's Charlie Perez, the front-runners maintained their starting positions through the first several minutes, but by midpoint they began to lap the field. As Perez passed Mike Truhe, their two cars tangled, but Perez maintained his command despite a late charge from Kyle Skidmore. Perez grabbed the win in the second event, and John Walentia nailed down second followed by Eric Clark. Perez locked up the top spot in Truck, and in the third main, Skidmore was first, and Clark and Marsh rounded out the field. Once the scores were tallied, Perez was at the top of the podium in Stock Truck, and Skidmore and Clark filled in numbers two and three.



HANDOUTS

The idea behind handout equipment is that it will eliminate any power or traction advantages among competitors and keep the racing based on driver skill and setup expertise. Each driver was issued a Team Orion Core stock motor and a set of Losi tires. To ensure that everyone used the handouts and didn't gain an unfair advantage, each tire was branded at the track and double-checked in tech before each race.

MASTERS

The Masters were ready to show that age and experience are the key to clean racing—until the start tone went off. As the field sped away, Dan Wendt and Gordy Willardson got together on the opening run, followed shortly by a collision between Frank Riley and



TQ Torry Hadley. Andy Liebmann showed the way briefly, until a spin collected three other cars. This allowed Donovan Gray to sneak into the top spot; he held off the hard-charging competitors to best in the first round. Gray fell to third in the second A-main, and 2001 winner Torry Hadley was back in TQ form. Hadley grabbed the

front spot, followed by Wild Cherry. As things geared up for the final round, the division title could have gone to anyone! Frank Riley, the fourth-place finisher in the previous rounds, eclipsed the win; Hadley held the runner-up spot, followed by Earl Valles. When points were tallied, Torry Hadley was in the victory lane; Gray and Cherry followed, both with 198 points out of a possible 200.



JUNIOR

The 16-and-under Juniors showed remarkable poise throughout the weekend. Washington State's Keith Hadley put his "rental" out front in a fast start, and Skyler Gall quickly jumped into second. An early tangle after Gall got sideways piled up Scot Robicheaux and Cody Ostmeier. Keith extended his lead during the Mains after Cody and Skyler locked wheels several times. The Junior front-runners finished as they had qualified: Hadley took the overall win followed by Ostmeier and Gall.

PRO'S PITCH IN

Reigning Masters champion Torry Hadley and his son Keith made the trek to the Nationals from their home in Washington State. By the end of qualifying on Saturday, Torry had TQ'd in the Masters division, and Keith had locked up the number-one slot in Juniors; it looked as though the Hadleys were headed for a storybook finish. But come Sunday, Team Hadley's luck took a turn for the worse—but not because of anything that happened on the track. The night before, some low-rent individuals broke into the Hadleys' SUV and made off with their racing stuff. As word about their misfortune spread in the pits, Matt Francis and many competitors pooled their resources to get the duo backracing again. Using borrowed equipment, the Hadleys were ready in time for their respective A-mains—both winning their divisions.



FAST CARS, FAST PEOPLE

You could learn a lot about how to successfully run a race by watching the group from Intermountain RC Raceway. Their well-organized people constantly had things moving from the pits into tech to the on-deck "dugout." A large display at one end of the track indicated the current racing round, so everyone knew what was going on at all times. The first group rolled out around 9 a.m., and by 12:15 p.m., the IRCR had rocketed through the first 21 rounds!



ON TRACK

The off-road track was designed by Brent Kolan, the same guy who created IRCR's incredible April Fools track. True to Brent's form, the layout featured several challenging turns, bumps and berms, assorted tabletops, wild elevation changes and a long backstretch. A sweeping downhill turn led the cars into a nicely spaced double. Those who attempted to sky the twin peaks by clamping the throttle had to be wary of the near switch-back right-hander that sent the racers back toward the start/finish line.



WINNERS

STOCK BUGGY

FIN	QUAL	DRIVER	CHASSIS	MOTOR	BATTERY	ESC	RADIO	TIRES	BODY	RATIO
1	1	Mike Truhe	Losi Triple-X	Orion handout	Orion 3000 HV	Novak C2	Airtronics M8	Handout	Stock	23/92
2	2	Cliff Nicholson	Losi Triple-X	Orion handout	Orion 2400 HV	LRP V71	Airtronics M8	Handout	Phobia	21/82
3	3	Brian Westerman	Losi Triple-X KE	Orion handout	World Class	Novak C2	Airtronics M8	Handout	Phobia	21/78
4	4	Christian Toic	Associated RC10 B3	Orion handout	Kamakazi	LRP	Airtronics M8	Handout	Stock	22/81
5	5	Eric Clark	Losi Triple-X	Orion handout	Kamakazi	Novak	Airtronics M8	Handout	Stock	22/78
6	7	Chris Marsh	Losi Triple-X	Orion handout	World Class	Novak	Airtronics M8	Handout	Stock	22/78
7	6	Eric Pesto	Losi Triple-X KE	Orion handout	Power Push	Novak	Airtronics 3PS	Handout	Stock	22/82
8	8	Charlie Perez	Assoc. RC10 B3 FT	Orion handout	Pro-Match	Novak C2	Airtronics	Handout	Stock	21/81
9	10	John Walentia	Associated B3	Orion handout	Reedy	LRP	Airtronics	Handout	Pro-Line	22/81
10	9	Kyle Skidmore	Associated B3	Orion handout	Reedy R3K	LRP	JR R-1	Handout	Stock	23/84

2WD TRUCK

1	1	Charlie Perez	Assoc. RC10 T3 FT	Orion handout	Pro-Match	Novak C2	Airtronics	Handout	Stock	19/87
2	2	Kyle Skidmore	Associated RC10 T3	Orion handout	Reedy R3K	LRP	JR R-1	Handout	Pro-Line	19/87
3	3	Eric Clark	Losi Triple-XT	Orion handout	Kamakazi	Novak	Airtronics M8	Handout	Losi	18/88
4	6	John Walentia	Associated RC10T3	Orion handout	Reedy	LRP	Airtronics	Handout	Pro-Line	18/87
5	4	Chris Marsh	Losi Triple-XT	Orion handout	World Class	Novak	Airtronics M8	Handout	Fury	18/88
6	7	Eric Pesto	Kyosho Ultima EP	Orion handout	Power Push	Novak	Airtronics 3PS	Handout	Stock	19/90
7	5	Mike Truhe	Losi Triple-XT	Orion handout	Orion 3000 HV	Novak C2	Airtronics M8	Handout	Stock	*
8	10	Wayne Ashmore	Losi Triple-XT	Orion handout	Peak	Novak	Airtronics	Handout	Stock	18/88
9	8	Brian Westerman	Losi Triple-XT MFE	Orion handout	World Class	Novak	Airtronics M8	Handout	Fury	18/88
10	9	Christian Toic	Associated RC10T3	Orion handout	Kamakazi	LRP	Airtronics	Handout	Pro-Line	19/87

4WD BUGGY

1	2	Mike Truhe	Losi Double-X 4	Orion handout	Orion 3000 HV	Novak C2	Airtronics M8	Handout	Stock	*
2	1	Cliff Nicholson	Losi Double-X 4	Orion handout	Orion 2400 HV	LRP V 7.1	Airtronics M8	Handout	Double-X 4 Hot	22/84
3	3	Brian Westerman	Losi Double-X 4 WE	Orion handout	World Class	Novak	Airtronics M8	Handout	Double-X 4 Hot	22/84
4	4	Alex Mazurkewycz	Losi Double-X 4	Orion handout	Gizmos	Novak	JR R-1	Handout	Stock	21/84
5	9	Jonathan Noone	Losi Double-X 4	Orion handout	Kamakazi	GM V-12	Airtronics	Handout	Stock	22/84
6	6	Paige O'Meara	Losi/Robinette	Orion handout	Peak	LRP	Airtronics 3PS	Handout	Stock	21/86
7	7	Robert Kephart	Losi Double-X 4	Orion handout	Gizmos	LRP 7.1	Airtronics M8	Handout	Double-X 4 Hot	22/84
8	8	Ed Hoffman	Losi Double-X 4	Orion handout	Peak	LRP	Airtronics M8	Handout	Stock	21/84
9	10	Frank Riley	Losi Double-X 4	Orion handout	Trinity	Novak	Airtronics	Handout	Stock	19/84
10	5	Steve Duncan	Losi Double-X 4	Orion handout	Gizmos	Novak	Airtronics 3PS	Handout	Stock	20/84

MASTERS TRUCK

1	1	Torry Hadley	Losi Triple-XT	Orion handout	World Class	Novak Cyclone	Airtronics 3PS	Handout	Stock	18/86
2	4	Donovan Gray	Losi Triple-XT	Orion handout	Pro-Match	LRP	Airtronics	Handout	Stock	17/88
3	5	Wild Cherry	Associated T3	Orion handout	Reedy	LRP	Airtronics	Handout	Pro-Line	17/87
4	2	Frank Riley	Losi Triple-XT	Orion handout	Trinity	Novak	Airtronics	Handout	Pro-Line	22/100
5	6	Earl Valles	Associated RC10 T3	Orion handout	Orion	Novak	Airtronics M8	Handout	Pro-Line	17/87
6	8	Doug Patterson	Associated RC10 T3	Orion handout	Lightning	Novak	Airtronics M8	Handout	Pro-Line	17/87
7	7	Dan Wendt	Losi Triple-XT	Orion handout	Gizmos	LRP	Airtronics M8	Handout	Fury	18/86
8	9	Gordy Willardson	Losi Triple-XT	Orion handout	Peak	Novak	Airtronics M8	Handout	Stock	18/88
9	10	Tony Huber	Assoc. RC10 T3 FT	Orion handout	Panasonic	Novak C2	Futaba 3PJ	Handout	Pro-Line	19/87
10	3	Andy Liebmann	Losi Triple-XT MF	Orion handout	Gizmos	Novak Cyclone	Airtronics M8	Handout	Stock	18/88

JUNIORS BUGGY

1	1	Keith Hadley	Losi Triple-X	Orion handout	World Class	Novak Cyclone	JR R-1	Handout	Stock	22/81
2	2	Cody Ostermeier	Associated B3	Orion handout	Gizmos	Novak	Airtronics 3PS	Handout	Pro-Line	22/81
3	3	Skyler Gall	Losi Triple-X KE	Orion handout	Orion	Novak	Airtronics M8	Handout	Phobia	22/81
4	5	Scott Robicheaux	Losi Triple-X	Orion handout	Peak	Novak C2	Airtronics CX2P	Handout	Phobia	21/82
5	4	Kevin Spann	Losi Triple-X KE	Orion handout	Orion 2400	Novak Dually	Futaba Magnum Jr.	Handout	Phobia	21/82
6	6	Nic Watts	Associated RC10 B3	Orion handout	Trinity 3000	Novak	Futaba Magnum Jr.	Handout	Stock	20/84

* Information not supplied by driver ■



Low-cost tricks
that work

8 cheap speed tricks

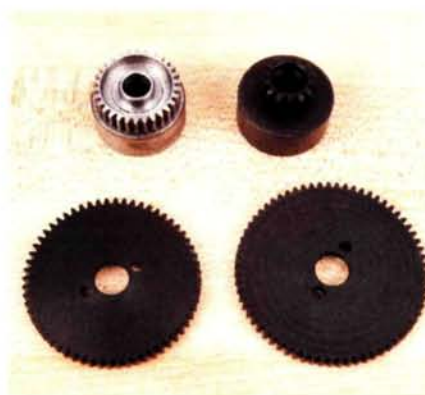
by Stephen Bess

1 Cut the comm

Rebuildable stock motors and machine-wound modifieds can benefit from this cheap and easy step. Even when brand-new, most motor commutators are out of round. The copper segments are press-fit onto the armature at the factory, and if your motor packaging doesn't have the words "factory trued" on it somewhere, you can enhance efficiency and even speed simply by "cutting" (or truing) your comm. If you don't own a comm lathe, check with your local hobby shop or track; chances are, you'll find someone who's willing to cut your comm for a small fee—or even for nothing.



Top left: most budget modified motors will benefit from having their commutators trued on a comm lathe—more horsepower for a relatively low investment. Bottom: this illustrates how out-of-round the commutators on budget modified motors can be. This comm was colored entirely with a black-ink permanent marker and then lightly cut on a lathe. It's easy to see how a full cut on a high-quality lathe will minimize the likelihood of brush bounce and enhance horsepower.



Nitro cars, too, can benefit from gearing changes. The large clutch-bell/small-spur gear combination on the left will deliver much more speed than the combination on the right—as long as the engine is strong enough to turn the gears.

2 Gear up

Whether you want more top speed or harder acceleration, a simple, inexpensive gear swap will almost always accomplish your goal. Want more top speed to drag-race your friends? Gear up by using a pinion gear with more teeth; if you have a 20-tooth pinion, for instance, bump up to a 23-tooth. After the pinion swap, your vehicle's top speed will increase, but there's a tradeoff: run time will decrease.

For harder acceleration, use a pinion gear with fewer teeth or a spur gear with more teeth. Gear swapping is cheap and easy, and it almost always nets eye-popping results without your having to alter any other parts on your vehicle.

You should be able to buy a pinion and spur gear for your car for \$10 or so; a clutch bell for your nitro burner costs about the same price.

3

Remove the carb restricter

If your nitro engine has a restricter and you want more power, try removing it! If you aren't sure whether your engine has a restricter, remove the air filter and look into the carb opening. Do you see a plastic or metal plug in the venturi? If you do, use a small flat-head screwdriver to pry it out through the carb's neck, and then re-install the filter. Retune the engine, and feel the power—for free!



The white plug is a restricter; it makes the carb opening smaller to restrict power.



Using a fuel that contains a higher percentage of nitro (within reasonable limits) can increase a nitro engine's power output.

4

Use a fuel with a higher percentage of nitro

You should always break in an engine with the fuel you plan to use regularly, but some nitro guys use 10- or 20-percent-nitro for break-in and later use 20 or 30 percent. If you feel you need more power, buy a gallon of fuel containing 10 percent more nitro than your regular fuel. After you've richened the fuel mixture by adjusting the needles and retuned the engine for the first few tanks, you'll notice a snappier throttle response and more overall power. Using a higher-nitro-content fuel after break-in isn't recommended, but it will usually increase power. And the power is cheap; you'll pay only two or three more dollars per gallon.

5

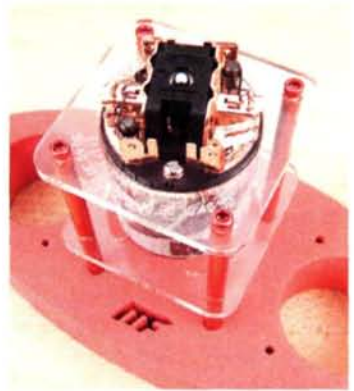
Increase motor timing to 20 degrees

An incredible amount of "free" horsepower can be harnessed simply by increasing a motor's timing (this applies to machine-wound motors and hand-wound modifieds). Most racers have found that advancing the timing by 20 degrees works magic; in a recent dyno test, a handful of Trinity's new Speed Gems motors were tested at zero timing and at 20 degrees, and the differences were staggering. The motors with advanced timing all produced up to a staggering 40 percent increase in power.

To advance your motor's timing, you must rotate the endbell counterclockwise, and that involves loosening the two endbell screws (they're at 90 degrees away from the brush hoods). Some motors have the degrees of timing clearly marked on their labels; others simply have reference marks. If there isn't a clear timing scale on the motor, simply rotate the endbell until the timing mark is 6.3mm (1/4 inch) from the dimple in the motor can located between the magnets.



Use a precise measuring device or even a simple ruler to determine the proper endbell/brush timing. This Speed Gems Pro motor has an accurate scale printed on its label, but it's always best to check the accuracy of those "tick" marks by measuring.



A motor-timing jig such as this one from Trinity can also be used to measure and set timing.

6

Free the drive train

Plastic and brass bushings cause power-robbing friction, and friction means slow. Free your vehicle's drive train with a set of ball bearings, and you'll enjoy longer run times and slightly increased speed. Ball bearings don't develop play as they wear, so the drive-train parts will last longer, too.

Ball-bearing-equipped vehicles will run faster and more efficiently when the bearings are regularly cleaned and relubed. Bearing maintenance is simple and requires only a can of motor spray. After cleaning the bearings with motor spray, be sure to relube them with a high-quality bearing oil.

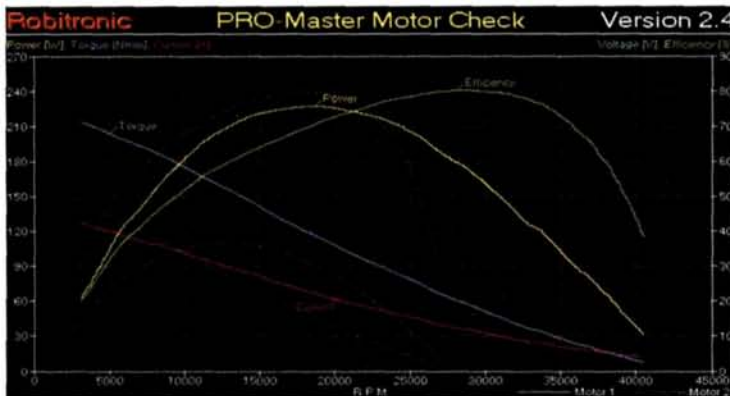
Elsewhere on your vehicle, you can beat friction by checking your wheels and gear mesh. If the wheels don't spin freely, check that the wheel nuts haven't been over-tightened. If they are too tight, back the wheel nuts out a few threads until the wheels spin freely. Similarly, a too-tight gear mesh will cause binding and a loss of speed. To set your gear mesh properly, insert a strip of paper between the pinion and spur gears, push them together, tighten the motor-mount screws, remove the paper and voilà—perfect gear mesh.



To make a car run as smoothly and efficiently as possible, ball bearings (left) are the best option. Plastic bushings (center) or bronze/Oilite bushings are very inexpensive, but they can adversely affect performance as they get dirty and wear.



Bearings generally have thick grease behind their seals; when you have a dozen or so bearings, that can mean a significant increase in drive-train drag. Clean the bearings and lubricate them with a thin, high-quality lube to ensure that more power reaches the ground instead of being eaten by the bearing friction.



This dyno graph shows the incredible gains that are available with just a little extra battery power. The dotted lines show the performance of an Orion 10x2 Core on 4 cells, and the solid lines show performance with 6 cells. You can check out the numerical data in the chart below.

EFFECT OF INCREASING CELL COUNT

No. of cells	Battery voltage	Power output (watts)	Torque (Newton mm)	Maximum rpm
4	5	110.2	166.6	28,096
5	6.25	162.4	200.7	34,633
6	7.5	227	235.7	43,113

Motor: Team Orion 10x2 Core modified

At three voltage levels, the performance results illustrated in the graph show a very pronounced improvement as the number of cells is increased. Although the dyno can't test for much above 6-cell voltage levels, this gives you a good idea of what to expect when you add cells; jumping from 4 to 6 cells offered a 50-percent voltage increase, but don't expect this result if you add 2 cells to a 6-cell pack (you will see a 33.3-percent voltage increase, though—a very noticeable kick in the pants for your electric machine). You can't just keep adding cells and expecting a commensurate increase in performance; you will reach a point of diminishing returns. Adding 1 to 4 cells, however, can make an incredible difference. Just be sure to adjust your gear ratios to avoid overloading your electronics. The greater the number of cells added, the greater the required adjustment to the gear ratio.

7 Use more cells

Most electrics run on industry-standard 6-cell packs. Enhancing speed and acceleration power, however, is as easy as buying a 7-cell pack, which costs only a little more than a 6-cell. The extra 1.2 volts supplied by the extra cell is enough to add several miles per hour to your vehicle. If you plan to enter organized races, check with the track to see whether 7-cell packs are allowed. If you aren't interested in organized racing and just want all-out speed, consult your speed controller's instructions to find its motor and battery limits.

To install more than 7 cells, you'll have to be handy with a soldering iron and build your own pack. If your ESC can handle 10 cells, build a 10-cell pack! With low-turn modifieds, however, you must be careful when increasing pack voltage; an ESC's manufacturer may claim that it will support 10 cells, but it might not—with a 7-turn modified. When in doubt, contact the ESC's manufacturer.

If you don't know your way around wiring and soldering irons, consult an experienced RC car guy or the folks at your local hobby shop. You must also keep charging in mind; most chargers aren't designed to charge more than 7 cells.

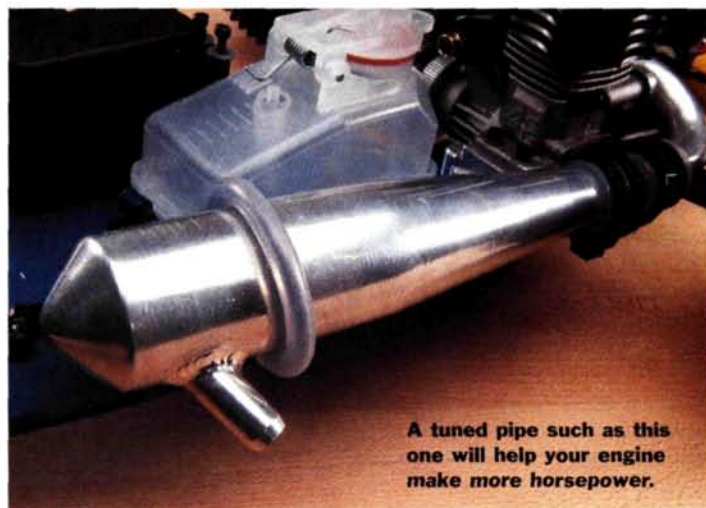
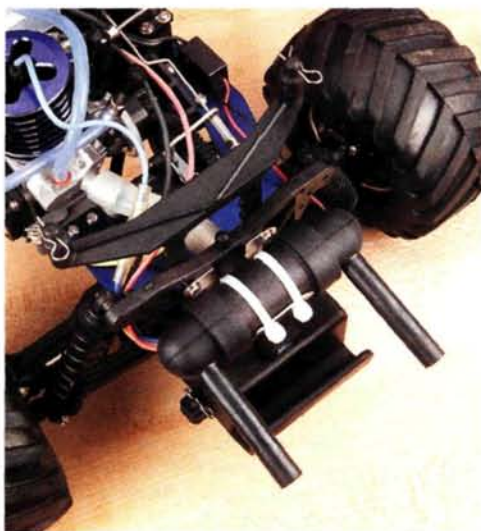


Using a battery pack with more cells is one of the most cost-effective ways to increase the performance of an electric-powered RC vehicle. Duratrax and other major battery manufacturers offer assembled 7-cell packs, but you'll have to be handy with a soldering iron if you want a pack with 8 or more cells.

8 Install a tuned pipe

OK; this tip isn't really cheap, but it's an important one. Most nitro RTRs and unassembled kits come with an expansion muffler (a small can-shaped unit) or a relatively simple exhaust pipe. Power gains of up to 40 percent may be achieved instantly by replacing an expansion muffler or stock pipe with a high-quality tuned pipe. Tuned pipes are designed to work with your nitro engine's exhaust pulses to maximize efficiency and power. Some pipes produce more low-end power, and others offer more top-end power. Your hobby shop can help you pick a pipe. Expect to pay at least \$20.

A dual-outlet muffler such as this one may look cool, but it isn't nearly as good for maximizing horsepower as a tuned exhaust system is.



A tuned pipe such as this one will help your engine make more horsepower.

Increasing your vehicle's speed and power is easy if you can afford to buy a more powerful engine or motor and new batteries. But if you're interested in staying within your budget, you have several options to make your RC car a parking-lot missile. Put just a few of these tips into action, and you'll free up speed and power from where you never knew it existed!

SOURCE GUIDE

TRINITY PRODUCTS INC. (732) 635-1600; teamtrinity.com.

DURATRAX distributed by Great Planes (800) 682-8948; duratrax.com.

Tire gluing—the right way!

4 steps to stick with

by Gary Katzer

All right; you've picked up a new set of tires and a new set of rims to go with them. Now you need to put the two together. This is an important job—don't worry, though; in four simple steps, your tires will be glued tightly for stay-stuck performance.

Step 1. Prep the rims and tires

Before you slide those new tires onto the rims, take a few moments to make sure that the glue will stick to the tires and rims properly. With a piece of Scotch-Brite pad, scuff up the rim where the bead of the tire will go. If the rim is chrome plated, you will have to completely remove the chrome plating from the rim where the bead meets it, and this task will take extra time and effort. To remove any remaining dust caused by the Scotch-Brite's scuffing, wipe the bead area of the rim with a rag and some motor spray, denatured alcohol, or a degreaser. Removing the inserts from the tires will make it easier to clean them. Spray cleaner on another rag, and wipe down the inside bead of the tire. The tires are coated with a mold-release agent to free them from the mold after the manufacturing process has been completed, but if the agent isn't removed, it will prevent CA from sticking properly to the tire.



YOU'LL NEED

- CA glue.
- Scotch-Brite pad.
- Motor spray/denatured alcohol/degreaser.
- Lint-free towels.
- Tire balancer with weights.
- Safety goggles.



Step 2. Place the tire on the rim

When the rims and tires have dried, replace the inserts in the tires. If the inserts are the open-cell type, be careful not to bunch them up inside the tires. After the inserts have been installed, pull the tires onto the rims. Work each tire back and forth on the rim until the bead sits on the rim properly. A high spot on the bead will cause a high spot on the outside of the tire, and that will cause unwanted vibration.



Step 3. Apply glue

You can use one of two methods to glue your tires. The first is to use a tire fixture such as those sold by RPM and Tamiya. They both sell fixtures for sedan tires, and RPM also sells a larger one

designed for off-road use. They work similarly—by pulling one of the beads of the tire away from the rim. Apply a light coating of glue around the bead, and release the pressure on the fixture to allow the tire to mate with the rim. A bit of glue oozing out from between the tire and rim is OK, but too much glue is not a good thing, as it can seep onto the inserts and ruin them. Use a napkin to wipe any excess glue off the face of the tire. When one side of the tire has dried, flip it over and glue the other bead.

You can also glue your tires by hand. Hold a tire in one hand, use your thumb to pull the bead away from the rim, and apply a drop or two of glue. Rotate the tire and apply glue every 1/4 inch or so using the same technique as before. When the bead is coated with glue, use a few rubber bands to secure the tire to the rim until the glue has dried.

SELECTING THE RIGHT CA



Many thicknesses and brands of CA are available, but for gluing tires, use one with a fast-acting formula. Though a quick-drying glue won't give you much time to reposition the tire on the rim before the glue cures, a slow-curing glue will allow the tire to squirm on the rim until the glue has dried. With the simple steps described here, you shouldn't

need a ton of time to reposition the tire on the rim once you've applied the glue. Team Losi, Pro-Line, Trinity, Acer Racing and others offer high-quality tire glues. Always use RC brands; stay away from "crazy" glues.

Some good advice when using CA is to use a small extension on the end of the bottle (Losi's glue includes one). This will allow you to control the flow more evenly and accurately because when it comes to CA, too much is not a good thing.

Step 4. Balance the tires

An unbalanced tire can have the same effect on your car's handling as a bent axle. In fact, an unbalanced tire can bend an axle if the vibrations are bad enough. Trinity's Matt Francis Tire Balancer tool



is easy to use and will help prevent unnecessary vibrations. Put the wheel on the balancer and give it a slow spin. If the tire is balanced, it should slowly come to a stop at various points every time you spin it. If the tire seesaws at the same place every time you spin it, it needs balancing. Apply a small piece of lead tire tape straight across from the low point, and spin the wheel again. Keep applying small pieces of lead tape until the tire is balanced.



A fresh set of tires can have a huge impact on your racing machine's overall performance. If you take your time when you glue your new meats, you will be rewarded with long life and consistent performance. As an added benefit, you won't need to reglue your tires as often because they'll adhere better to the rim to begin with. Keep in mind that proper preparation prevents poor performance.

SOURCE GUIDE

ACER RACING (310) 472-8090; acerracing.com.

PRO-LINE (909) 849-9781; pro-lineracing.com.

RPM R/C PRODUCTS (909) 393-0366; rpmrcproducts.com.

TAMIYA AMERICA INC. (800) 826-4922; tamiyausa.com.

TEAM LOSI: distributed by Horizon Hobby Inc. (800) 338-4639; teamlosi.com; horizonhobby.com.

TRINITY PRODUCTS INC. (732) 635-1600; teamtrinity.com.

Hardcore Racing Components

Mutant Maxx!

While many are content to leave their Traxxas T-Maxxes in stock trim, others have converted their trucks into all-out racing machines. Everyone starts with the same platform, so part of this modification game involves getting your truck to handle better than the next guy's. Want to outdo your friend's efforts on his truck? Try this. The new Mutant Maxx Conversion Kit not only lowers the chassis with an $\frac{1}{8}$ -scale buggy-like configuration, but it also adds a center differential and an in-line shaft drive. I tested the setup along with the full Hardcore parts kit; here's how it came together.



Parts list

HARDCORE RACING COMPONENTS

- Mutant Maxx Conversion Kit
 - Base Kit (chassis, upper deck, standoffs and hardware)—HCR-03601 (blue), HCR-03602 (green), HCR-03603 (purple), HCR-03604 (silver); \$239
 - Complete Upgrade Kit—HCR-03611 (blue), HCR-03612 (green), HCR-03613 (purple), HCR-03614 (silver); \$189
- Titanium skidplates (F/R)—HCR-03084/HCR-03094; \$42 each
- Aluminum parts
 - Suspension kit (arms, hinge pins, pillow-ball setscrews)—HCR-03044; \$235
 - Steering knuckles—HCR-03214; \$59/pair
 - Shock tower—HCR-03124; \$49/pair
 - Matrix wheels—HCR-03404; \$210/set of 4
 - Diff case—HCR-03224; \$85
 - Steering-knuckle caps—HCR-03254; \$18/set of 4
- Ultimate front body sets—HCR-03134; \$42/pair
- Titanium bulkhead braces—HCR-03174; \$28/pair
- Mutant head for O.S. RZ engine—HCR-00134; \$69

ROBINSON RACING

- T-Maxx hardened-steel diff-gear set—8590; 42.50

O.S. ENGINES

- .21 RZ-V01B engine—13860; \$299.99

PRO-LINE

- Bow Tie tires—1079-00; \$29/pair
- 2000 Ford F-350 body—3096-00; \$26

SIDEWINDER

- 20%-nitro Pro Race fuel—\$21

VENOM

- Temperature gauge—VEN-0600; \$38.99

PHOTOS BY WALTER SIDAS AND PETE HALL



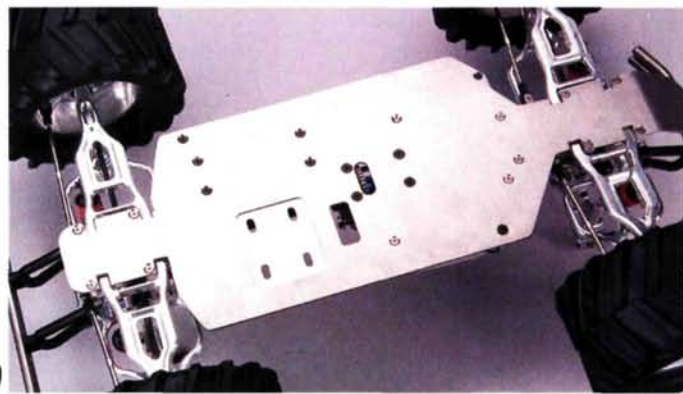
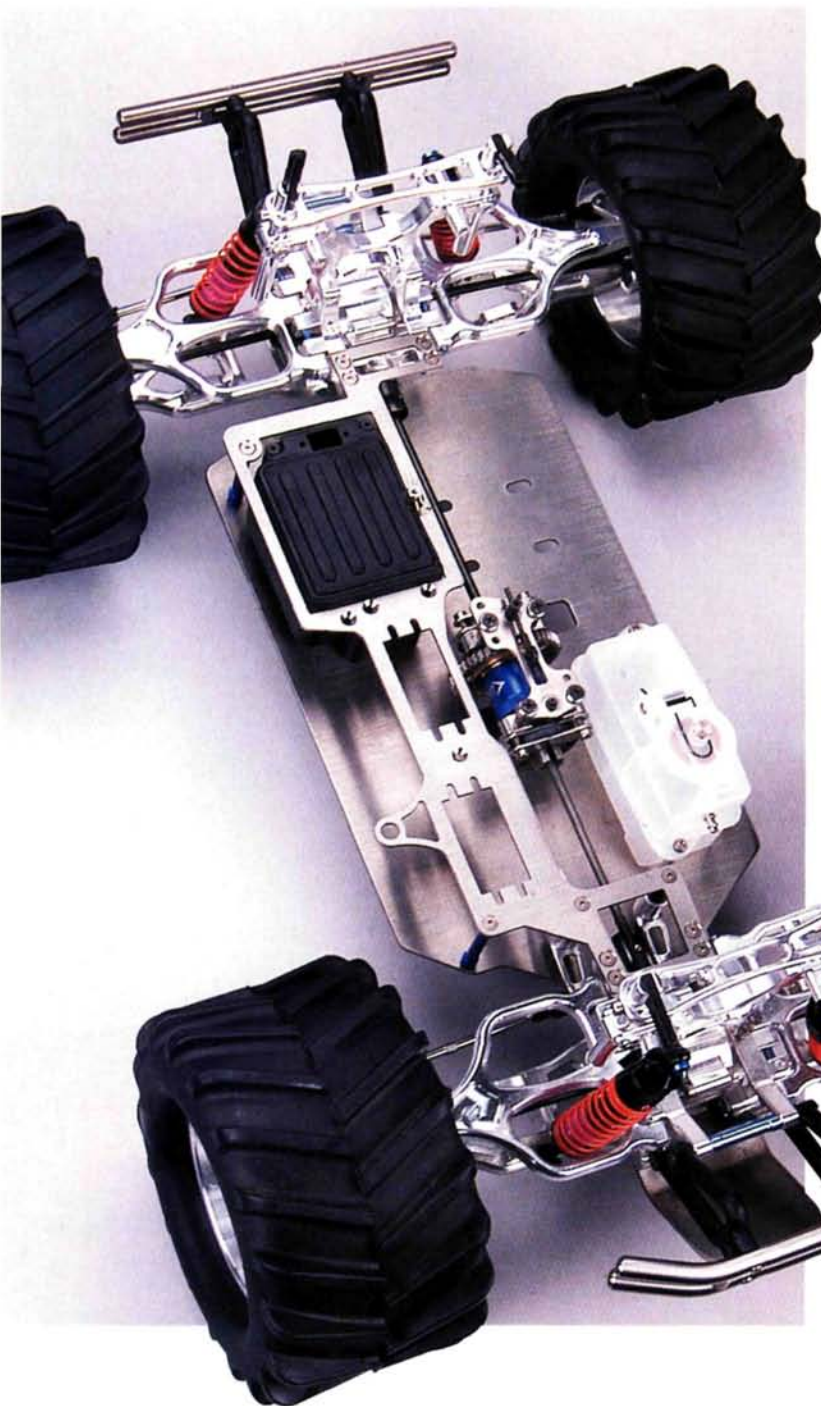
Performance

I couldn't wait to get the Hardcore Mutant Maxx out onto the track to see what it could do. I figured that its taller gearing would make it suffer off the line, but it was more controllable than any .21-powered T-Maxx I have driven. Its top speed at the end of the straightaway was also impressive. The stock T-Maxx has only one brake; all four tires slow it down at the same rate, so it can't carry much speed into the turns. The Hardcore center diff and dual-disc-brake setup allows you to fine-tune front and rear braking in a way that allows you to enter turns a lot faster.

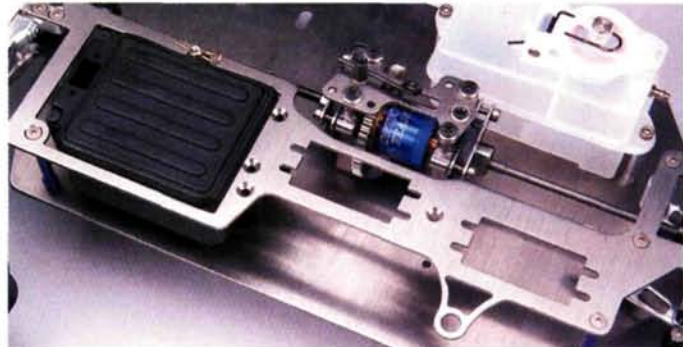
Thanks to its low center of gravity (CG), the Hardcore T-Maxx stays much flatter in corners. The stock truck has a high CG, and because of excessive chassis roll, it tends to get a lot of three-wheel action when it's powering out of turns. That isn't the case with the

Mutant Maxx; all four tires stay planted. Acceleration was excellent; certainly, .21 power helped, but it takes a strong drive train to get the power to the wheels. With its buggy-style in-line center diff and steel dogbones, the Mutant Maxx is highly unlikely to suffer from axle twist or universal-joint flex. For hustling around a racetrack, the Hardcore setup is probably unbeatable. The only downside to having a tow CG is reduced ground clearance; once you make the conversion, your Maxx won't be as adept at crawling over obstacles. But it will probably be the fastest thing on the track!

Hardcore's Mutant Maxx is impressive, and its handling characteristics may easily be compared with those of an 1/8-scale off-road buggy. This bad boy sure is a pleasure to drive, and in the right hands, it could eat any T-Maxx for lunch!



The very strong, titanium chassis plate is **designed to** allow the engine to sit as low as it can go in the truck, so you can use any non-pull-start engine and a Starter box.



The radio plate spans the entire chassis. The receiver box is sealed to keep water and dust away from the electronics.

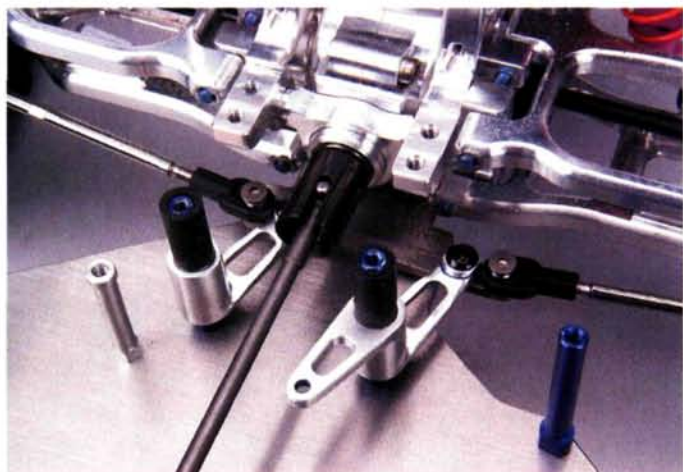
CHASSIS. The chassis isn't what we're used to seeing. A stock T-Maxx's main chassis is attached to the top of the front and rear bulkheads, but this 2.75mm-thick titanium-plate chassis is bolted to the bottom of them. This lowers the truck's CG and allows the use of any non-pull-start .21 engine and Starter box.

The new chassis is longer to make it more stable than the stock chassis. The screw holes on the bottom have been countersunk to prevent the screw heads from scraping on the ground, and a titanium upper deck runs from the front to the rear to stiffen the chassis and provide a mounting place for the throttle/brake servo, steering servo and receiver box.

FOR HUSTLING AROUND A RACE-TRACK, THE HARDCORE SETUP IS PROBABLY UNBEATABLE.

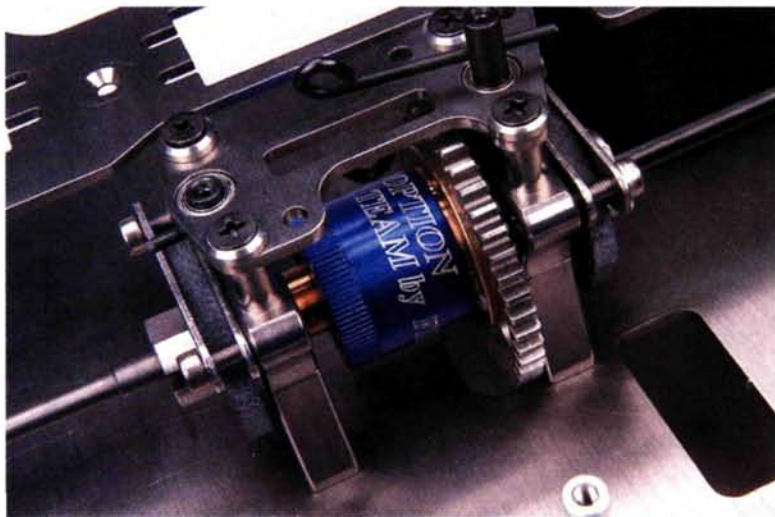
SUSPENSION AND STEERING. I assembled my test truck with every Suspension hop-up Hardcore offers, including aluminum Suspension arms, bulkheads and shock towers and titanium hinge pins and pivot balls. The chassis is supported by four, 1/8-scale buggy shocks. T-Maxx bellcranks control the steering, and the chassis and upper deck support the pivot shafts.

To control the steering, my truck has aluminum bellcranks connected by a titanium link. A servo-saver isn't built in to the bellcranks, so I recommend that you use a heavy-duty one on the steering servo.



DRIVE TRAIN. Hardcore replaced the stock gearbox with a heavy-duty 1/8-scale center **diff that** offers many advantages. Eliminating the stock gearbox and its reverse gears, shafts and case saves a lot of weight. Tune the center diff to your liking by filling it with silicone fluids of various weights; front and rear brake bias is also adjustable. Long dogbones connect the center diff to the front and rear diffs, which are in Hardcore's aluminum diff housing. Hardcore fitted the truck with Robinson Racing hardened-steel diff gears and MIP CVDs. The ends of the CVDs ride in Hardcore's aluminum steering knuckles.

The conversion doesn't use the stock transmission; instead, an Vs-scale center diff does all the work. The dual-disc setup allows you to adjust front and rear brake bias.



TRICK TRUCK STUFF

TAMIYA Terra Crusher tarmac tire & wheel set

If you mostly run your Terra Crusher on the street, check out these new Tamiya tires. Their unique tread design is sure to hook up on most paved surfaces. The tires come with thick foam inserts, and they're mounted (but not glued) on stylish "chromed"-plastic wheels. Their outer diameter is smaller than the stock Terra treaded tires', and they're sold in pairs with new wheel nuts.

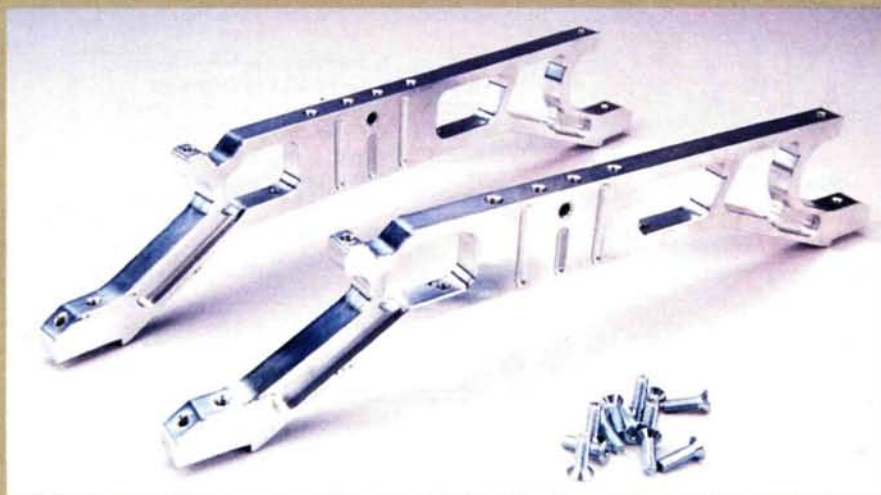
TGM-02 144/0P-498; \$37.99/pair.



NEW ERA Super-duty lower braces for Traxxas T-Maxx

New Era's 8mm-thick braces are made out of solid aluminum billet and have been machined in low-stress areas to reduce weight. The tops of the braces span the chassis plate, and they're screwed to both ends of the chassis. To attach the braces, you have to drill holes in the chassis, and New Era includes a template to help you position the holes correctly.

TRM326SD; \$49.95.



TALK TRUCK!

Send your "4x4" questions and comments to Kevin Hetmanski, kevinb@airage.com.

SOURCE GUIDE

HARDCORE RACING COMPONENTS (661) 294-5032; racinghardcore.com.

MIP (626) 339-9007; miponline.com.

NEW ERA MODELS (603) 888-4453; neweramodels.com.

O.S. ENGINES distributed by Great Planes Model Distributors (800) 682-8948; osengines.com.

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SIDEWINDER FUELS distributed by Morgan Fuel (800) 633-7556; (334) 347-3525; morganfuel.com.

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TRAXXAS CORP. (888) 872-9972; traxxas.com.

VENOM RACING (949) 451-8551; venom-racing.com.

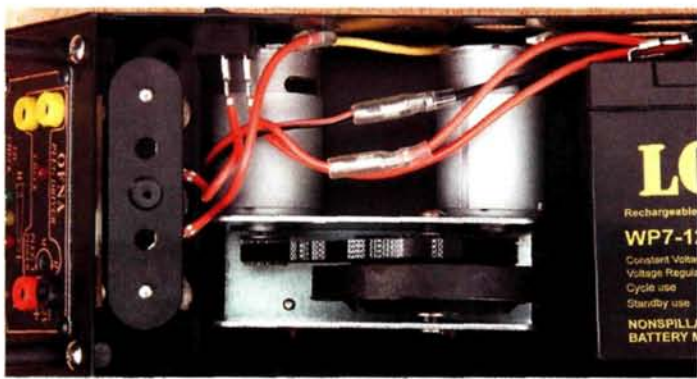
Thinking outside the starter box

Starter boxes are among the most underrated, under-appreciated RC accessories. A pull-start mechanism makes life easier for the RTR crowd, but what do all the racers with non-pull-start engines do? Most use a starter box; this holds a spinning starting wheel and bumps it precisely against a model's flywheel. When properly set up, a starter box can make engine starting a 2-second job. This month, I explain how to set up and use your starter box so that you'll be able to bump-start your engine easily.

STARTER-BOX SETUP TIPS

POWER CHOICE. Properly wiring your battery is vital to using a starter box. Your starter box probably has one, 12V gel-cell or two, 6-cell packs. Both setups do a great job, but the heavier 12V gel-cells last longer but have lower voltage and cranking power while the opposite is true of 6-cells. Regardless of your power source, here's what to look for when you first wire your starter box.

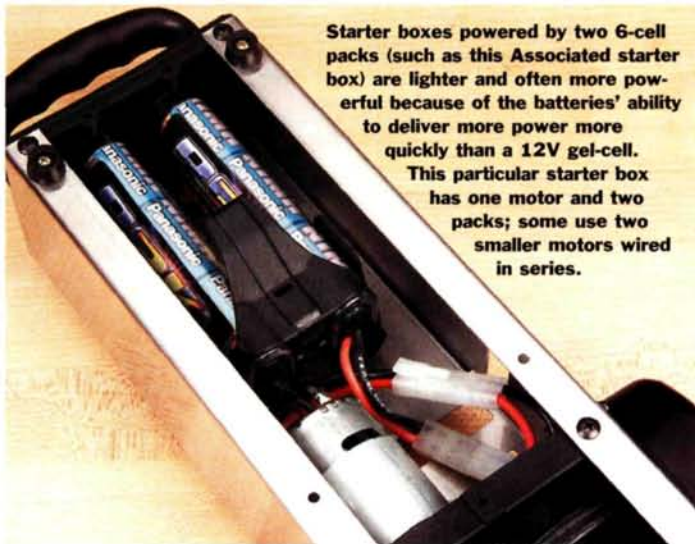
Twelve-volt power. A 12V battery is large and must be secured solidly to the starter-box frame. If it isn't absolutely secure, it will move around, and as wires are frayed and pulled, you run the risk that the positive and negative terminals will touch the same piece of metal and will short the battery; this can be dangerous. Use heavy-duty zip-ties to ensure that the battery is firmly secured (if your starter box's instruction manual doesn't direct you otherwise). Most 12V battery leads can be crimped onto the battery terminals; take the time to secure these leads properly by squeezing the crimped part with needle-nose pliers (don't touch any other metal parts!).



and causing a short circuit. This starter box has access holes that allow you to reach the terminals without removing the battery from the box.

Above: typical of most 12V starter boxes, this OFNA unit uses two motors wired in series and connected to a 12V gel-cell battery. Gel-cells are generally less powerful because of their lower voltage and higher resistance, but they're much cheaper than the alternative—two Ni-Cds. **Left:** the 12V battery should be properly secured inside the starter box to prevent the exposed terminals from contacting the metal box

Stick-pack-power. I've yet to see a stick-pack-powered starter box that didn't come with straps to secure a pair of packs. If your box is the exception to this, tape the two packs together and secure them in the box with zip-ties. If you have to, drill holes in the starter-box body for the ties to pass through.



Starter boxes powered by two 6-cell packs (such as this Associated starter box) are lighter and often more powerful because of the batteries' ability to deliver more power more quickly than a 12V gel-cell. This particular starter box has one motor and two packs; some use two smaller motors wired in series.

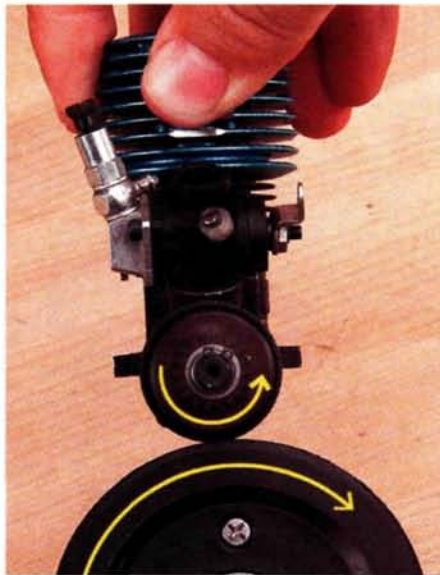


In a starter box designed for two stick packs, the wiring usually has the packs connected in series with a Y-harness. This increases the voltage going to the starter motors to 14.4 volts—much more power than a single pack.

WHEN PROPERLY SET UP, A STARTER BOX CAN MAKE ENGINE STARTING A 2-SECOND JOB.

DIRECTION OF ROTATION. In Operation, an RC engine's crankshaft spins counterclockwise (viewed from the front of the engine); this means the starter-box wheel must turn clockwise (viewed in the same manner) to spin the flywheel (and, with it, the crankshaft) in the proper direction. If the Starter wheel turns in the wrong direction, the engine will turn over and sound as if it wants to Start, but it won't fire. Or you may actually be able to get the engine running backwards, but it will quit as soon as you apply throttle. Either scenario leads to misdirected troubleshooting efforts, so always check and recheck the rotation of the starter-box wheel. If it isn't turning in the direction you need it to, you should either reverse the polarity

of the motor by swapping the positions of the positive and negative motor wires, or simply turn the vehicle around 180 degrees in relation to the Starter box.



Here, the Starter wheel has been removed from the Starter box for clarity. As viewed from the flywheel side of the engine, the Starter wheel should always turn clockwise to turn the flywheel counterclockwise.

GUIDE SETUP. Starter boxes have some type of plastic chassis guides that you attach to the box lid, but many of us never take the time to use the guides, and when we do, we often fail to set them up properly. It takes only 10 minutes to set up the chassis guides, and they'll save you hours at the track.

Start by putting your chassis on the box lid and aligning the chassis' flywheel opening with the Starter wheel. This will be easier if you first remove the vehicle's body so that you can see straight through to the flywheel opening from above. Having centered the flywheel over the Starter wheel, note where the chassis sits on the box lid. Next, use a permanent-ink pen to mark the chassis perimeter on the starter-box top. Using the pen marks as reference points, install the guides on the box lid using the supplied fasteners. If you've positioned the guides accurately on your marks, you should now be able to drop your vehicle onto the box and have the starting wheel properly aligned with the flywheel.



Above: when you install the starter-box guides, take the time to Position them so that they are in a corner of the chassis or recess in the Suspension arm; this will prevent the chassis from moving when you're trying to Start the engine.

Left: don't focus on centering the car on the Starter box. Your only consideration should be the proper alignment of the starter-box wheel and the engine flywheel; you might even have to move the guides to one side of the starter box (as seen here, on the starting pedal) to Position the vehicle properly.

SWITCH HEIGHT. All Starter boxes use a pressure-sensitive switch to automatically power the Starter motor when the vehicle is pressed against the box's lid or Starter pedal. The amount of lid or pedal travel (usually called "switch height") required to Start the motor is adjustable, and it's important to proper starter-box Operation. A properly set up Starter box will power the Starter motor well before the flywheel touches the Starter wheel; this extra spin-up time allows the Starter wheel to reach maximum momentum before the flywheel touches it.

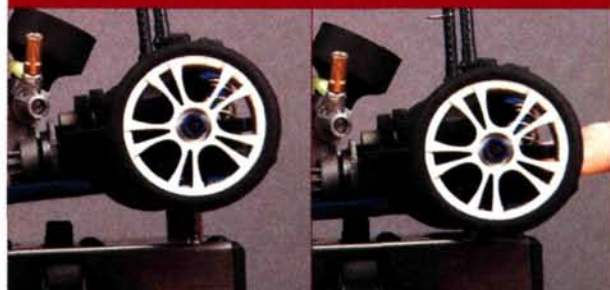
Switch height is usually controlled by turning large screws that adjust the Starter box's spring-loaded lid. Adjust your starter-box switch so that it spins the starter wheel when the vehicle's chassis is still well above the wheel but isn't so sensitive that the starter motor begins to spin as soon as the chassis is placed on the box.



The height of the starter-box switch is easily adjusted and very important for proper Operation.

FIRE IT UP

Now that you've set up your starter box properly, place your vehicle on it. Turn on your radio System before you start your engine so that you'll be able to control the throttle, and make sure you have a fully charged glow-starter on the glow plug. Press the vehicle down until the starter wheel Starts to spin, and allow it to reach full speed before you engage the engine's flywheel with the starter wheel. Press the vehicle down firmly to engage the wheel; as long as your glow plug is good, your fuel is fresh and the engine has been tuned properly, it should turn over and fire up immediately! If the wheel Stalls, and you aren't trying to Start an excessively tight, new engine, check the starter box's battery; it probably needs a Charge.



When the starter-box motor has reached full speed, press down sharply on the chassis to bring the starter wheel and flywheel together. Newer engines may require more effort because the fit between the piston and sleeve is so tight. It isn't unusual for the piston to stick in the top of the sleeve—even with the assistance of a starter box. If this is the case, preheat your engine with a heat gun or a hair dryer.

NEW FOR NITRO

OFNA Multibox

OFNA's new Multibox Sports a powerful 750 Starter motor, it accepts 12V gel-cells or stick packs, and it has three starter-wheel positions to allow you to start virtually any engine. Its brushed-stainless-steel case looks trick, and you can buy the box unassembled or in RTR form.

OFNA Multibox-item nos. **10246** (unassembled), **0246 RTR**; \$99.95, \$159.95 (RTR).

OFNA Racing (949) 586-2910; ofna.com.



KHB RACING PRODUCTS Quick Fit

KHB's Quick-Fit converts O.S., Picco, KMegatech, Novarossi, HPI, Fantom and many more .12 and .15 pull-start engines to the Traxxas EZ Start System. Although this particular kit is designed to adapt the

original EZ-Start, conversions are also available for the latest, second-generation EZ-Start that's included with Traxxas' new TRX 2.5 engine. This adapter is easy to install and allows the use of a variety of high-performance engines in Traxxas vehicles; it also allows the use of the EZ-Start in any non-Traxxas vehicles it will fit.

Item **KHBC100**; \$44.95.

KHB Racing; www.khbracing.com.



TECH Q & A

Q I've heard several people at my hobby shop discuss chitches and how to tune them to make them engage later to obtain more power. I have a Nitro TC3 and a Mugen MBX-RR. How can I make the clutches make more power, and when should I consider doing this? Why would I want to mess with the clutches? I've heard that some engines work better than others after their clutches have been tuned. [email]

ChrisRC

A On-road and off-road vehicles can benefit

from having a clutch that's properly tuned to suit the track conditions. First, what's your track like? Does it have lots of traction, or is it slick? Your answers determine whether or not you should tune your clutch. On high traction tracks, you could trim 1/8 inch off the clutch shoes trailing edges, or drill 2mm holes near the trailing edge. Both actions will lighten the shoe and allow the engine to rev faster before engaging the clutch. Trim or drill the shoes until you're pleased with the clutch's Performance, if your track is slick, leave the clutch alone; high-rpm clutch engagement on a slick track can mean an instant spinout.

Much depends on your specific engine; if it has soft low-end power, it will benefit more from clutch-shoe trimming than an engine with lots of bottom-end power. With less powerful engines, if the clutch engages at higher rpm, you'll notice harder acceleration. Don't expect humongous Performance gains, but a little experimentation might better match your engine to your vehicle and track conditions.



Small Hghtening holes can be drilled in the trailing end of the clutch shoes (opposite end from the clutch spring) to delay clutch engagement and improve acceleration when using more powerful engines.

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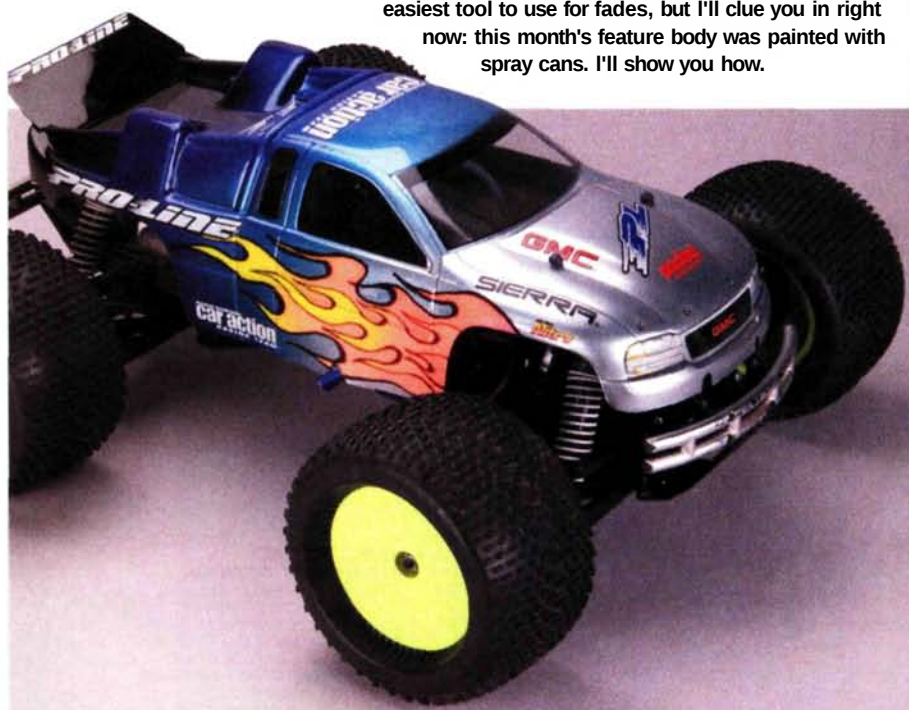


No fear fades

A "No Fear" poster hangs on a wall in my home Studio; it shows a surfer blazing through the "pipe" as the wave closes in behind him. Beneath the photo is the simple caption, "Never let your fears stand in the way of your dreams."

What does this motivational message have to do with bodies? Actually, a lot; we all want to improve our painting skills, but if you repeatedly do the same thing, you'll always end up with the same results. To improve, you must cast aside your fears and self-doubts and try something new.

The technique that most people want to tackle first is the "fade"—combining several colors with a seamless transition between them. It's a lot easier to do than you might think, but only if you stay on top of the two most important elements: color choice and paint control. Let's look at color interaction; I'll explain how to select colors that work together every time. You'll also learn about the various types of fades. Yes, an airbrush is the easiest tool to use for fades, but I'll clue you in right now: this month's feature body was painted with spray cans. I'll show you how.

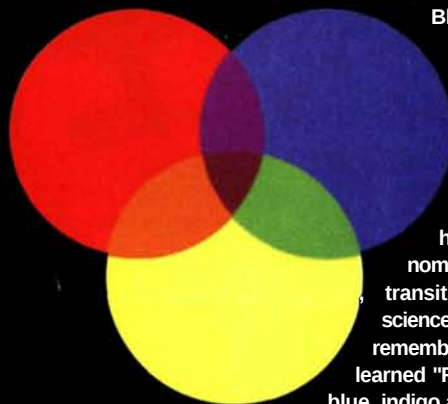


The color wheel and spectrum

Rather than make you snooze through a lecture on color theory, I'll just ask you to look at how the primary colors of red, yellow and blue have been combined on this color wheel to create various shades and color transitions. A distinct change occurs where the yellow and red mix to create orange, the yellow and blue make green, and the red and blue change to purple (see "Primary

Blends" in the "Fade Types" sidebar). The brown center section is the result of the three primary colors merging. (I haven't painted many cars brown, but you never know when "doody" will call.)

If you've ever seen a rainbow after a storm or looked at the refracted light from a prism, you've no doubt admired how the colors blend, and this rainbow phenomenon comes in handy when you select transitional colors for a body. Maybe your art or science teacher taught you a phrase to help you remember the order of the color spectrum; I learned "Roy G. Biv" (red, orange, yellow, green, blue, indigo and violet).



GETTING cannEd



Let's try a few types of fades on this body—a classic fire-spectrum flame Job and a silver-to-candy-blue fade that ends with a black tail section. It won't be hard; trust me. I've prepped and masked the body and applied a hand-cut flame scheme; any of the commercial masks would work fine for this, too.



Step 1. As I mentioned, black has to be the leading color. Holding the can well away from the body, aim a few quick bursts at the inside of the taillight section and allow the overspray to flow around the body's interior corners.



Step 2. Next, paint with the candy blue and spray only as far as the "B" pillar (the post behind the driver's head); let the remaining overspray flow from there. Apply the blue until you're satisfied with the intensity of the color, and for a softer transition between the blue and the black, lightly mist black into the body's rear corners.

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RS4
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#7614 Honda NSX GT (140mm W.B.)

#7612 Mazda RX-7 (140mm W.B.)

#7609 Mercedes CLK DTM (150mm W.B.)

#7611 Toyota AE86 Trueno (140mm W.B.)

#7605 Corvette C5-R (150mm W.B.)

#7608 Ford Mustang Cobra (150mm W.B.)

#7610 Honda Civic Coupe (150mm W.B.)

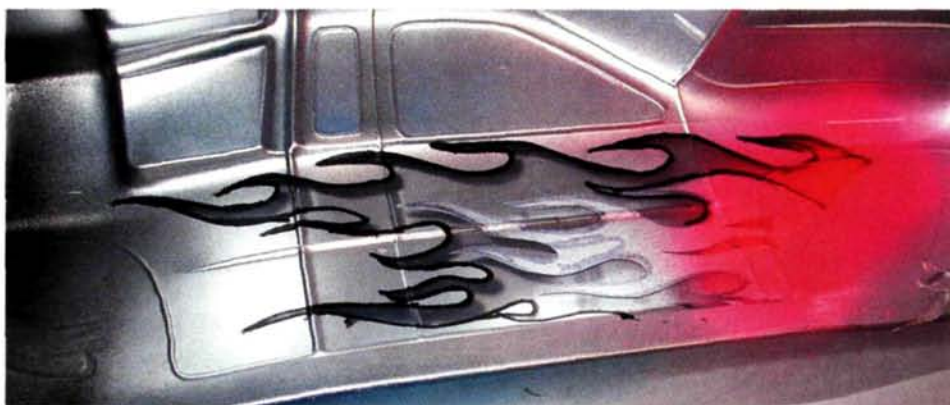
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BODY SHOP



Step 3. The car's nose is silver, which will also serve as the body backing color. The silver blends nicely with the blue and gives it a rich metallic look. I pulled the mask away and used a paint pen to outline the edges of the flames.



Step 4. After the silver paint has dried, remove the flame mask and spray all of the flame tips with a single pass of fluorescent red.



Step 5. The opposite edges of the flames get a shot of fluorescent yellow.

IT'S AN
EFFECT THAT
LOOKS
KINDA
TRICKY, BUT
IT ISN'T
REALLY.

Step 6. Apply another coat of yellow to the tips of the flames and another coat of red to the nose. Build the colors toward each other, and the orange transition will appear naturally. Once the red and yellow blend has dried, spray the entire area with a white backing coat.



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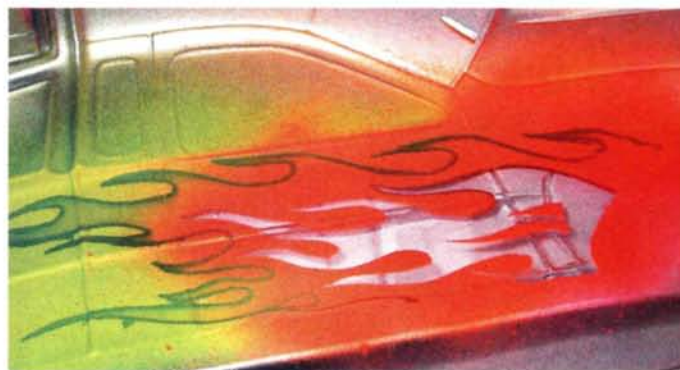
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BODY SHOP

Step 7. For added depth to the flames, I pulled out a center section of the masking and sprayed a yellow to orange layer. Remove the overspray film, cut out the body and apply your stickers. People will wonder who painted your ride!

Was it really you?



Fades offer yet another way to expand your arsenal of body-painting tricks and to truly personalize your paint jobs. It's another example of an effect that looks kinda tricky, but it isn't really. My goal every month is to share a new tip or technique or to introduce a product that will inspire you to try something different. If you like a paint job you see here and decide to copy it exactly as it appears, I'm genuinely flattered. If nothing else, I hope that "Body Shop" sparks an idea that makes your paint job outstanding. The next time you sit down with a body, follow the advice given on my poster. Remember: no fear! That's my pep talk this time around; now go paint something!

FADE TYPES



ADJOINING COLORS. The easiest way to begin is to choose two colors that are adjacent in the spectrum that naturally merge into each other. For example: red into orange, orange into yellow, yellow into green, green into blue and blue into purple. With these color choices, even poorly applied paints will seem to flow together naturally.



PRIMARY BLENDS. This color selection uses two primary colors, and, as we saw on the color wheel, a third transitional color forms when two primary colors are combined. The red-to-yellow fade creates the classic red/orange/yellow "fire" spectrum; the red-to-blue fade creates a cool purple blend; and the yellow-to-blue fade has the classic "Ty-D-Bol" green transition.



SAME-COLOR SHIFTS. Another cool fade to experiment with is to combine varied shades of one color; for example, go from natural orange into fluorescent orange, candy red to natural red, navy blue to sky blue, and so on. But don't combine metallic shades with non-metallic shades. That usually dilutes the intensity of both colors and just doesn't look too good.

BLACK AND WHITE. You can blend any color with black and white, but you must use the black or white as the lead color. For example, if you've decided to paint a white nose, start by hitting the body's beak with a couple of quick shots of white (this breaks the rule that says you have to apply dark colors first). Do this because if you apply the white last, it will accentuate any stray overspray; if you wiped off the overspray before you applied the white, the white will make the wiped area more obvious. When you transition into the white with another color, be careful not to go too far into the white. Instead, spray on a light coat as a bridge into the area, and then add a little more white. To smooth the blend, repeat the process until you're satisfied with the transition.

Black is such a powerful color that it's tough to use it as a backing color in a fade; it powers through other paint layers and makes the colors look muddy. If you want to incorporate black into a fade job, make every effort to use it first.



CANDY STORE. The translucent properties of candy colors provide unique opportunities for body coloration. They can be blended into one another, and you can also get a really cool effect by fading from a candy color into silver. Silver used as the backing color gives the candy hue a metallic look, and a blend from a candy color into silver looks amazing.

New in the Shop

PARMA X20 touring car body

The touring Shell pictured in our "Fresh Paint" sidebar is perfect for the TC racer who wants a new look. The Parma X20 sedan is molded in 0.030 Lexan, is ROAR-legal, and it has classic, Euro-look, beautifully molded lines. The wing has a cool multilevel design and large side dams; according to Parma, the body has perfect balanced aerodynamics. It comes with vinyl window masks and precut full-color decals and is available for nitro and electric vehicles.

Item nos.-10124/10114, 190mm/200mm; \$24.99.



TRINITY Body Blast Aerosol

Body Blast has long been a favorite for getting rid of permanent marker and removing paint overspray on Lexan. Now, Trinity offers Body Blast in a 4-ounce aerosol can. The spray is just as effective as ever at cleaning and polishing, but now it has the convenience of an aerosol, too.

Item no. TRN6077; \$5.99.

FRESH Kelly Bean, Mentor, OH

PAINT While we're on the subject of fades, credit P A I N T 'gd&Jto Kelly Bean from Parma for his sweet paintwork on the flamed X20 body. It features Parma's "Big Flames" mask, and he bordered it with Faskolor black. The main colors are blue FasGlitter and a perfect green. After he had removed the flame mask, Kelly blended Faskolor fluorescent green and blue, and he backed them with white. Since Kelly works in Parma's R&D department, I wonder whether that window tint is something we'll see from Parma in the future. I hope so!

Do you have a sharp, uncluttered photo of your best paintwork? Send it in! Explain the types of paint, products and techniques you used to finish it. Be sure to include your full name and address and your email address if you're online. For Information about sending electronic images, check out www.caraction.com. Send print or slide photographs to "Body Shop," RC Car Action, 100 East Ridge, Ridgefield, CT 06877-4606 USA.



CONTACT THE BODY SHOP

Send your "Body Shop" questions and comments; to Bob Hastings, bobh@airage.com.

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Hot Bodies Micro Charge

MINI AND MICRO RC ENTHUSIASTS have been waiting for an affordable and easy-to-operate AC/DC battery charger for the small Ni-Cd and NiMH battery packs that are typically used in mini and micro RC vehicles. Hot Bodies has answered the call with its new Micro Charge—an affordable unit that safely charges the small battery packs used in micro cars and the receiver packs of nitro vehicles.



SPECIFICATIONS

Case size	4.25x3x2.5 in.
Input	117V AC; 12V DC
Output	4 to 7 cells AC; 4 to 8 cells DC
Charge rate	1, 2, or 4 amps
Input cord	USA-type plug for AC; alligator clips for DC
Output cord	Tamiya-style connector
Voltage protection	Yes
AC fuse protection	No
Item no.	31500
Price	\$59.99

FEATURES

AC/DC OPERATION. The charger plugs into a 110V wall socket with an AC cord, and alligator clips are included so that when AC power isn't available, you can hook up the charger to a 12V power supply, such as a car battery.

NI-CD AND NIMH COMPATIBILITY. According to Hot Bodies, the charger senses the type of battery pack that's plugged into the unit (Ni-Cd or NiMH) and automatically adjusts the charge parameters to provide a safe charge every time. When the battery pack is fully charged, a peak-detection feature stops the charge cycle.

ADJUSTABLE CHARGE RATE. Three charge rates (1, 2 and 4 amps) allow you to charge a variety of battery packs, but the 1A and 2A rates can only be used when the charger is plugged into a wall socket. This is fine for charging the small cells that are common in micro racing. The 4A charge rate is for stick packs and other batteries with sub-C cells, but it can be used only when the charger is hooked up to a car battery or other 12V DC power source.

SIMPLE OPERATION. To begin the charge cycle, all you have to do is plug the charger into a 110V wall socket or connect it to a 12V DC power supply, select the amp rate, and press the start button. An LED lights up during the cycle, and a tone sounds when you plug the charger into a wall socket or power supply. It sounds again when the charge cycle has been completed.

COMPACT DESIGN. The small, 4.25x3x2.5-inch case allows the Micro Charge to fit inside your toolbox without taking up too much room.

OUTPUT PROTECTION. The charger is protected from short circuits caused by accidentally reversing the polarity of the battery pack.

TESTING

The Micro Charge was tested with a variety of 4-, 5- and 6-cell battery packs for the HPI Micro RS4 and Kyosho Mini-Z and was also used to charge several Ni-Cd and NiMH receiver packs for nitro vehicles. The charger's power lead has a standard Tamiya connector; to charge battery packs with micro connectors, you'll need to use the micro-connector adapter that comes with the Micro RS4 (you still have that adapter, don't you?). If your packs don't use a Tamiya plug or a micro connector, you'll have to make an adapter.

When used with the 1A charge rate to peak NiMH battery packs and the 2A rate for Ni-Cds, the Micro Charge worked as advertised and successfully charged all of my battery packs without a glitch. The packs were slightly warm after the charge process, but not hot, which means that they received a full charge. For a final test, the Micro Charge was connected to a 12V DC power supply to charge a 6-cell,

3000mAh battery pack at the 4A charge rate. About 45 minutes later, the charger emitted a beep to confirm that the charge cycle had ended, and the sub-C battery pack was fully charged.

THE VERDICT

The Micro Charge is a great value; it's easy to use, compact and offers AC plug-in convenience. The only task the Micro Charge isn't completely up to is versatile sub-C charging; although it does a fine job with DC power, the 2A limit with AC power makes it slow and inconvenient to charge full-size packs. But for nitro racers and mini and micro fans, the Hot Bodies Micro Charge works very well.

Hot Bodies Racing (909) 296-9340; hotbodiesonline.net.

Matt Francis RC Triple-XS Wheel Adapters

TRINITY'S MATT FRANCIS LINE NOW INCLUDES these anodized-aluminum widgets to replace the stock plastic wheel hexes on Team Losi's Triple-XS touring car. The Francis parts slide on in place of the stockers and are clamped to the axle by a tiny screw in each hex. This makes it impossible for the wheels to yank the hexes off during a tire swap, and that makes life easier in the pits. The Matt Francis wheel adapters took only about 2 minutes to install, and they fit very well, but heed the warning on the included instruction sheet: the tiny M2 screws that clamp the hexes are delicate. As soon as you feel them snug up, they're tight enough. Once they're installed, you'll never know the adapters are there when you're on the track, but at least you'll know they will still be there when you pull the wheels off.

Triple-XS Wheel Adapters—item no. TMF1123; \$25.

Matt Francis RC by Trinity Products (732) 635-1600; teamtrinity.com.



FINAL CALL
The Matt Francis bolt-on hexes are real frustration-savers.

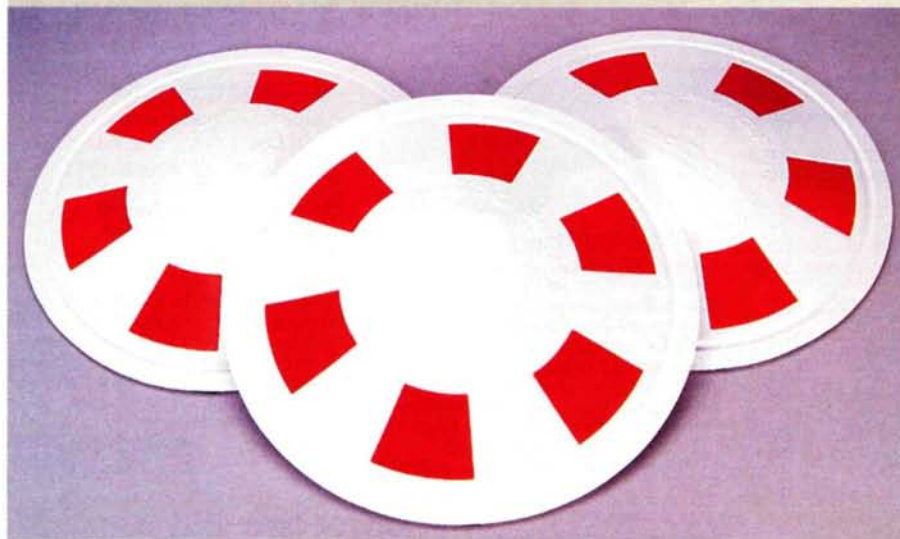
Hyper Hobbies Road Domes

PARKING-LOT PICKUP RACES ARE ALWAYS FUN, but keeping the course clearly defined can be tough; you and your buddies may all agree that the third parking-spot line is the first turn, but it's all too easy to "accidentally" cut the corner. Even if you're all Boy Scouts at race time, racing is just more fun when you're competing on something that at least resembles a track with clearly defined turn points. This is where Hyper Hobbies' Road Domes come in. The molded-plastic corner markers are light and tough, and they have soft rubber feet, so they stay put and look racier than neon-colored "dots" or steel plow discs (which are also heavy and hard to find). You'll need to spend a few minutes sticking the domes' decals and rubber feet into place before you can play. A few words of caution: if you and your buddies tend to drive over the corner markers as often as you drive around them, be prepared to do a lot of corner marshalling; the Road Domes' steep peaks will launch touring cars as though they were part of a Joey Chitwood stunt show.

FINAL CALL
Road Domes look great and won't "drift."

Hyper Hobbies Road Domes—\$25/pack of 5, \$47/10, \$112/25.

Hyper Hobbies (404) 228-9279; roaddome.com.



T.A. Emerald Performance Plus 3 motor cleaner

FINDING A PRODUCT TO BLAST YOUR MOTOR clean isn't hard, but finding one that's plastic-safe isn't quite as easy. According to the can's label, Performance Plus 3 is safe for plastics and even Lexan car bodies. Sure enough, a liberal dousing of a Team Associated TC3 and its Protoform body resulted in no crazing, cracking, or fogging; the only thing that happened is that the car was cleaner. Just about any type of RC goo we aimed PP3 at—whether it was old shock fluid, brush

dust, fuel residue, or good old-fashioned dirt—was easily blasted away by the powerful stream of solvent. Don't spray the stuff near a flame or on an arcing motor, since PP3 is highly flammable—not just the fluid itself, but the vapors, too. So use it only in a well-ventilated area, since the fumes are pretty noxious. **T.A. Emerald Performance Plus 3 motor cleaner**—item no. 4000; \$6.



FINAL CALL
Use PP3 safely, and your stuff will be clean.

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(800) 280-0020. ■

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